November 13, 1950

STEEL

The Magazine of Metalworking and Metalproducing

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EAST ENGINEERING

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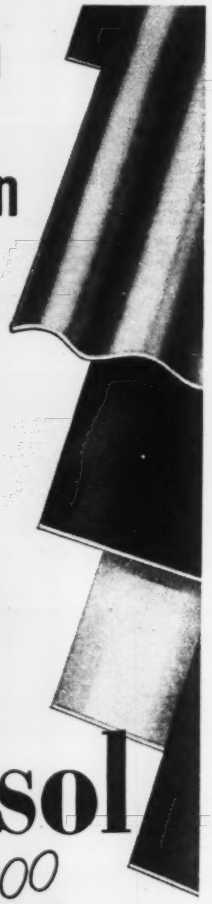

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Behind the Scenes . . .

How To Get Steel

We tagged along with ten STEEL editors last week to find out how to get steel. We didn't discover the answer, but we did get in on a first rate plant tour, of National Tube Co.'s Lorain, O., works. National Tube is a subsidiary of U. S. Steel Corp. The boys from upstairs gave a thorough inspection to the Lorain ore docks, blast furnaces, coke ovens, bessemer converters, the new continuous seamless tube mill, the quarter-mile long butt-weld pipe warehouse, blooming mill and butt-weld pipe mills.

Guiding us through the intricacies of the gigantic plant were Jack Tyson, manager of the warehouse and shipping department; Jim Light, assistant to the general superintendent; and Jim Ketterer, chief metallurgist. Helping to arrange the tour were Dick Packer, assistant to the president at National Tube, and Eric Ferguson of U. S. Steel's public relations department.

A Capital Suggestion

Russian planners have found a novel use for paved highways. They've had a real problem because some paved roads actually have been built, but, alas, there aren't enough motor vehicles in the U.S.S.R. to make adequate use of them. The Russian newspaper, *Sotsialisticheskoie Zemledelie,* reports:

"The broad and even highway between Moscow and Riazan stretches for many kilometers. For the second year the farmers of Kukhovitsy are using one side of the asphalt-covered highway for drying grain. For tens of kilometers the asphalt is covered with a thin layer of grain." The paper recommends that system to other farm areas.

A capital suggestion. We can probably expect a large highway construction program in Russia now that the planners have found a use for paved roads.

With a British Accent

While we're on the subject of foreign affairs, we'd like to point out our far-flung business interests. In Sheffield, England, we are making micrometers and related instruments, under the trade name of Shardlow. That's the English spelling of Shrdlu, of course.

Seven-League Boots

Those boys upstairs get around. Editor Irwin Such put on his seven-league boots not so long ago for a 2890-mile trip to Oklahoma and Texas.

He got as far south as Port Lavaca, Tex., to see Aluminum Co. of America's aluminum reduction plant. He got some data on Sheffield Steel Corp.'s expansion program at Houston, covered the meeting of the American Institute of Steel Construction at Houston, took a look-see at Lone Star Steel Corp.'s facilities in East Texas and got briefed on the oil and gas situation in Texas and Oklahoma. Texas, incidentally, has 55.1 per cent of all the crude oil reserves and 54.9 per cent of all the natural gas reserves in the U. S.

The liquefied petroleum gas industry is spreading like an oil fire, and Irwin did some researching into the industry's phenomenal expansion. Watch for forthcoming stories in STEEL on LP-gas and its significance to metalworking.

Irwin rounded out his two-week tour with a stopover at Chicago and the Metal Show.

Puzzle Corner

You've failed us, puzzle addicts. When we went to press on this page, no one had yet come through with the correct answer to the mice problem of Oct. 30. The answer is 239 cats each killed 4649 mice.

Try this one: Three men play a game with the understanding that the loser is to double the money of each of the other two. After three games, each has lost just once and each ends up with $24. With how much did each start?

Shrdlu

(Editorial Index—page 57)

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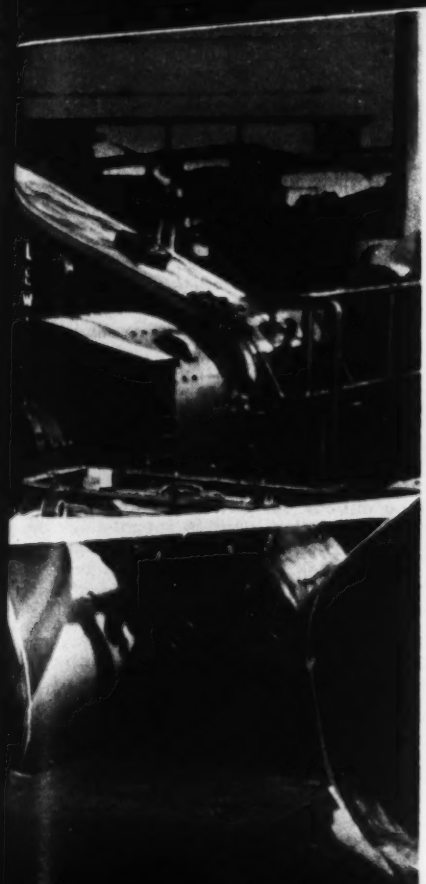
ROLLING MILL EQUIPMENT....

A Lewis 28 x 42 inch two-high skin pass mill at the West Leechburg plant of Allegheny Ludlum Steel Corporation.

This mill will handle stainless steel strip in coils up to 60 inch diameter and 15,000 lb. weight.

The mills are equipped with motorized screw-down, roller bearing rolls, Universal type spindles and motor-operated sled type roll changer.

This installation is typical of rolling mill equipment which Lewis furnishes the iron, steel and non-ferrous industries. Inquiries are always welcomed.



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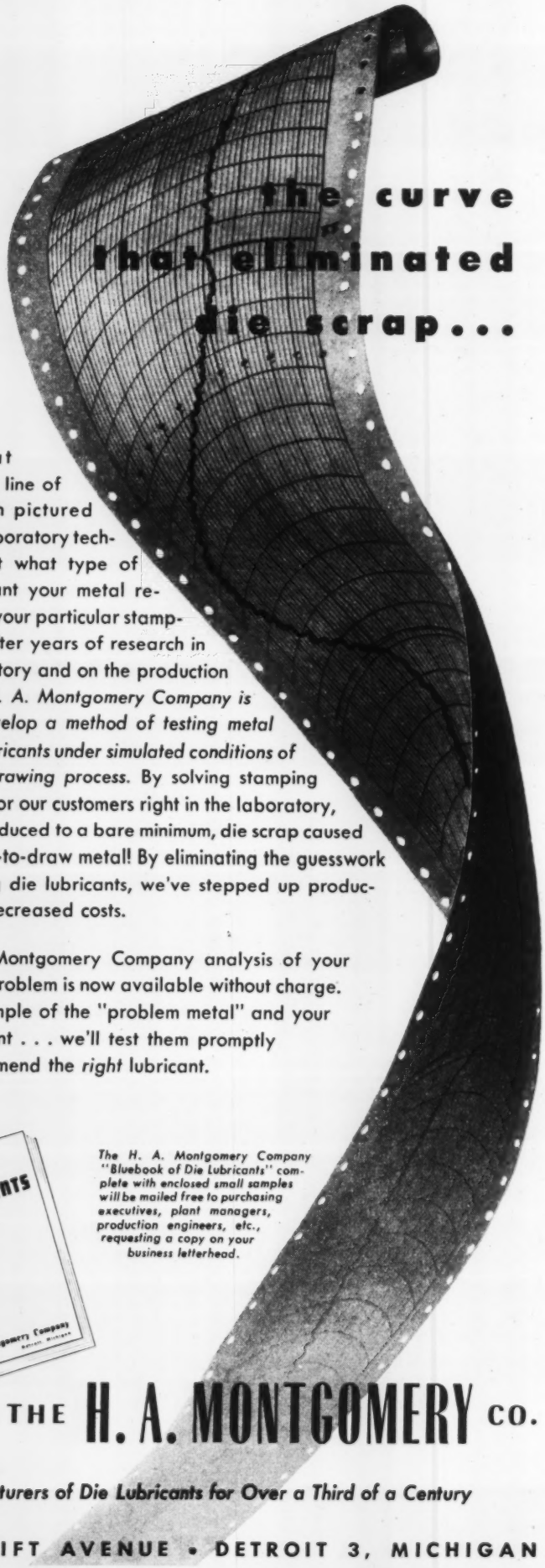

the curve that eliminated die scrap...

Yes, that curving line of the graph pictured tells our laboratory technicians just what type of die lubricant your metal requires for your particular stamping job! After years of research in the laboratory and on the production line, *The H. A. Montgomery Company is first to develop a method of testing metal and die lubricants under simulated conditions of the deep-drawing process.* By solving stamping problems for our customers right in the laboratory, we have reduced to a bare minimum, die scrap caused by difficult-to-draw metal! By eliminating the guesswork in selecting die lubricants, we've stepped up production and decreased costs.

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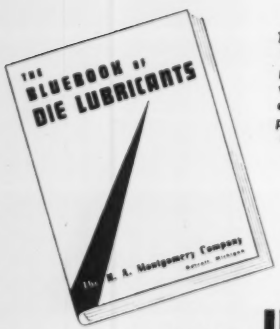

The H. A. Montgomery Company "Bluebook of Die Lubricants" complete with enclosed small samples will be mailed free to purchasing executives, plant managers, production engineers, etc., requesting a copy on your business letterhead.

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LETTERS
TO THE EDITORS

Whither Goes It

We would like to know where the 100 million ingot tons of steel, which is our current annual production, is used. During World War II, production approximated 80 million ingot tons, and there were tanks, ships and industrial buildings to build. We had to supply steel for Europe, including Russia.

Now we do not have a large shipbuilding program under way, steel tanks

are not in production yet, Europe is producing steel for shipment to the United States, and of course, no shipments are going to Russia. Where is all the steel going?

Mitchel Stern, General Manager
Camden Iron Works, Camden, N. J.

• *Steel ingot production in 1950 will be about 95 million ingot tons, well above the World War II peak of 89.6 million tons in 1944. This year will see 8 million cars and trucks, more than a million homes, record amounts of appliances and other peacetime goods. For details of where steel is going see* STEEL, *Nov. 6, p. 66.*

Missed the Address

Must have missed the write-up on Forman Insulating Screw Corp. May I have their address, please?

Benson Kurk, Superintendent
Potter & Brumfield Mfg. Co. Inc.,
Princeton, Ind.

• *Production and Engineering News at a Glance page carried the item, Aug. 28, 1950, page 71. Company address is 401 Broadway, New York 13, N. Y.*

Steel Production Breakdown

We were much interested in your lead article in the Oct. 16 issue, "Steel Supplies in 1951". It mentions the fact that while the ingot output of the industry is in excess of 100 million tons, the outlook for sustained production of finished rolled steel is roughly 75 million net tons. Can you tell us what part of this 75 million tons is normally classified as flat rolled product, i.e., plate, skelp, hot and cold rolled sheets, tin plate.

L. G. McKay, Vice President
Ohio Corrugating Co., Warren, O.

• *Product mix of finished steel production varies within certain limits according to character of demand. We can expect to see a greater than normal production of plates in the months ahead. July, 1950, production of finished steel was as follows: Hot and cold rolled and coated sheets, 29 per cent; hot and cold rolled strip, 6 per cent; black, tin and terne plate, 7.7 per cent; plate, 7.4 per cent. Balance of about 50 per cent was flat rolled products.*

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Next Week **.. Explosive Forces Widen Metallurgical Studies ... Design Simplicity Key to Blower Wheel Manufacture ... Overhead Tiering "Expands" Storage Space ... Wiremakers Evaluate New and Existing Facilities.**

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MicroRold 430 is used extensively for interior architectural trim, bar, restaurant and soda fountain components, table tops, etc. Washington Steel Corp. is currently producing polished sheets in standard sizes, 20 gauge and lighter, to replace chrome-nickel material vitally needed for the national defense program.

WASHINGTON STEEL CORPORATION

Washington, Pennsylvania

November 13, 1950

A Great Day for Freedom

Last Tuesday something happened in the United States that should cause all thoughtful citizens to take a fresh view of the future of the nation.

Here was the set-up, best exemplified by conditions in Ohio: The Truman administration in collaboration with a coalition of union labor leaders of CIO, AFL, United Mine Workers and railroad brotherhoods went all-out to defeat any senator or congressman who had favored the Taft-Hartley Act. Naturally, co-author Robert A. Taft was the prize target. That is why the battle in Ohio was so important.

The Truman administration sent into Ohio such eminent representatives as Vice President Barkley and induced W. Averell Harriman in a speech in Texas to attack Taft and to plug for Joseph Ferguson—a pitifully inadequate opponent. The union coalition, working out of New York and Washington, plastered the state with comic books, cartoons, propaganda, etc. all pitched on a class-hatred theme and utilizing to the limit the Hitler-Stalin theory that a lie once told and repeated frequently enough will be accepted as truth.

Pressure from top union leaders was terrific. A few union members were deprived of their union membership because they ventured to work actively for Senator Taft. Throughout the entire campaign, there was the definite implication that William Green, Philip Murray, John L. Lewis and the railroad brotherhood chiefs demanded a solid union vote against Taft. It was almost the equivalent of the dictator-line of Mussolini, Hitler and Stalin.

How did union members respond to this attempted dictatorship? In one suburban Cleveland precinct—populated by unionists, where only 53 Republicans were registered—375 votes were cast for Taft. One rather highly placed union official, in dutiful obeyance to orders from above, fired a subordinate for working for Taft. But last Tuesday, in the role of a red-blooded, freedom-loving American, he cast his ballot for Taft.

Taft carried every industrial county of Ohio, where unions were supposed to be strong. He carried rural districts where farmers resented union domination. He was supported by men and women who resented union arrogance.

Last Tuesday was a great day for freedom—for the untold millions who want to do their own thinking.

* * *

PROSPECT FAVORABLE: Outcome of last Tuesday's election will greatly increase the strength of opposition to some of President Truman's pet socialistic ideas in both houses of Congress. The administration's majorities are so slender that a few of Mr. Truman's "musts," such as repeal of the Taft-Hartley law, enactment of the Brannan plan and legislation authorizing socialized medicine, will be shelved for at least two years.

How the gains of the minority party will affect relations between government and business remain to be seen. It is quite probable that the vote of last Tuesday, which so clearly was a repudiation of many Truman policies and of many policies advocated by union leaders, will encourage many senators and congressmen to discount administration and union prestige more than heretofore. This would make for a greater degree of independent thinking in both houses.

One of the first issues on which the new temper of Congress will be tested will be the tax bill. It is certain that the excess profits tax will be considered much more carefully than

(OVER)

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would have been the case if the old Congress had held over unchanged. It also is likely that the entire subject of preparedness will be scrutinized more objectively.

The minority party should use its regained spirit of independence to help the nation out of its present difficulties.

* * *

GEOGRAPHICAL ACCENT: One cannot digest current news of expansion in industry without realizing that important growth in the older established areas of the east and midwest is matched or exceeded by spectacular additions to capacity in the far west and southwest. In this week's issue are details of expansion and modernization plans of Lone Star Steel Co., a relatively young outfit in Texas, and of Colorado Fuel & Iron Corp., a veteran in Colorado.

Lone Star is working toward an integrated steel plant designed to supply the southwestern oil industry with tubular goods and possibly plates. CF&I is planning extensive enlargements and improvements, including a major increase of steel ingot capacity from 1,320,000 to 1,645,000 tons annually at its Pueblo steelworks. These programs, considered in conjunction with previously announced expansion plans of steel companies on the west coast, emphasize the strong west and southwest accent on steel expansion.
—pp. 76, 77

* * *

FAMOUS NAMES FADE: Announcement by United States Steel Corp. that four subsidiaries will be consolidated into a single operating company Jan. 1 means that two famous names in iron and steel will fade from corporate titles after that date. United States Steel Corp. of Delaware, Carnegie-Illinois Steel Corp., H. C. Frick Coke Co. and United States Coal & Coke Co. will be brought together into a new company to be known as the United States Steel Co.

The names "Carnegie" and "Frick" have been identified with the industry continuously for a long time. Although Andrew Carnegie became interested in steelmaking in the sixties, his name did not appear in the corporate title of a steel company until Dec. 1, 1870, in Kloman, Carnegie & Co. Later it appeared in Carnegie, Phipps & Co. and eventually in Carnegie Steel Co. The Frick name came into Frick & Co. in 1871.

Next January, after 80 and 79 years, respectively, of continuous use, these names will disappear from letter heads, office doors, advertising and front page news. —p. 68

* * *

STAINLESS CONVEYORS? A number of companies are co-operating in experimental work on the use of stainless steel conveyor belts in the mining industry. Their interest has been aroused by the possibility of increasing belt life.

Steel belts weigh one-fifth as much as rubber belts and have a higher modulus of elasticity. Weight factor would reduce first cost by simplifying installation, would reduce the number of parts and possibly would permit use of smaller drive motors. However, steel belts are more difficult to track and keep in alignment than rubber belts, yet steel belts can be guided better with side rollers. The camber in the "as rolled" condition of many coils of continuous rolled steel is a problem requiring attention.

The companies co-operating in experimental projects state it is too early to say that stainless steel belts are commercially successful. Nevertheless some of the problems initially encountered have been solved and a number of installations have functioned satisfactorily to date. —p. 100

* * *

CURVILINEAL PLANING: We think of planers and shapers as machines in which the tool traverses a straight line. Rockford Machine Tool Co. has developed hydraulic tracer controlled tooling for these machines which permits them to do curvilineal or three-dimensional machining.

The tracer mechanism consists of a special head which can be mounted on any of the company's openside shapers, planers or shaper-planers either as a rail head or side head, a duplicator valve apparatus and an independent hydraulic pumping unit. These accessories permit the cutting tool to follow a path identical with that traced by a stylus upon a master form.

Machining in die work and in regular production runs is encountering increasing demand for generating contoured surfaces which conform to irregular mathematical curves. Development of turbine and jet propulsion is stimulating this demand. Adapting tracer control to planers and shapers is one timely way of solving these machining problems. —p. 94

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

BAD NEWS—Political observers have been saying: "Watch for bad news to come fast after the elections." Last week's news (elections excepted) was not cheerful, but more of it was coming from Asia than from Washington. Military activity by the Red Chinese raises the specter of a long war, more billions for the military, less material and manpower for production of civilian goods (p. 65). The military gradually will take an increasing share of the available steel, aluminum and other scarce materials. The problem of supplying small business will become more difficult, is occupying more attention at NPA.

MORE EXPANSION—As the military program grows, more is heard of the necessity for increasing basic metal capacity. Washington grumbles that the 10 per cent increase projected by the steel industry by the end of next year is not enough. It likely will be raised. Aluminum producers, with government backing, are seeking ways to get over their biggest obstacle to higher production—lack of power. Watch for new companies to enter the primary aluminum field. Meanwhile metals expansions programs develop. Colorado Fuel & Iron will spend $26.2 million in the West (p. 76). Lone Star Steel plans an integrated plant in Texas (p. 77). Reynolds is looking toward an aluminum plant in Mexico (p. 69).

HOW MUCH ORE—One of the problems in expanding steel capacity is that of shipping adequate supplies of iron ore. This year's lake movement (p. 67) may reach 80 million tons, provided the weather is favorable. Supplemented by unusually large all-rail shipments, this may provide enough to operate furnaces until the 1951 season opens, but the margin is not comfortable. Next year the pinch may be even tighter.

STEEL WAGES—Union and industry negotiators have finished their preliminary skirmishing in the steel wage case and are now down to cases. Watch for a settlement within the next few weeks. Probable increase, in direct wages and fringe benefits: About 10 per cent.

VEST-POCKET MILLS—Continuous casting can now be applied to about 15 per cent of steel output and improvements being perfected will increase its application to 25-30 per cent, says Isaac Harter, Babcock & Wilcox chairman (p. 66). Investment required is smaller than for integrated facilities and may be solution to New England's problem.

ZIG-ZAG COMFORT—Growing popularity of "zig-zag" seat cushion springs in 1951 passenger cars culminates a success story for Universal Wire's Bill Neely (p. 79). Lower manufacturing and shipping costs are big selling points for the new "debumping" method. Coil spring makers are in the fight with a new method of their own.

BOTH SIDES OF THE CURTAIN—Great Britain, West Germany and France are having a serious tussle with labor problems: Britons need men under 21 and women to fill the breach caused by their armament drive; German labor is squawking for a bigger say in management; inflation in France is causing howls for higher wages (p. 75) . . . Somewhere in Russia the Soviets don't need a big work force; that would be wherever they have set up the 30,000-ton forging press (p. 68) that was taken from Germany after the war . . . The Soviet Union has sufficient ore and coal reserves to challenge the United States' supremacy in steelmaking in the coming decades (p.68). So says Dr. W. C. Rueckel, vice president, Koppers Co. Inc.

HERE AND THERE IN INDUSTRY—A small businessman who wanted steel in the worst way went about getting it in the worst way and ended up getting a two-year penitentiary sentence (p. 68) . . . General Services Administration (p. 72) will soon be doing business under the Defense Production Act . . . After struggling with the railroads for over a year to get ferrous scrap rates reduced 20 per cent in southern territory, Institute of Scrap Iron & Steel (p. 72) petitioned ICC for action. Other petitions will follow for rates in other territories . . . Bethlehem got the bidding and working plans contract on the new National Defense fast cargo ship (p. 72) . . . The October ingot production established an alltime high of 8,718,978 tons or 102 per cent of capacity.

SUMMARY NEWS SUMMARY
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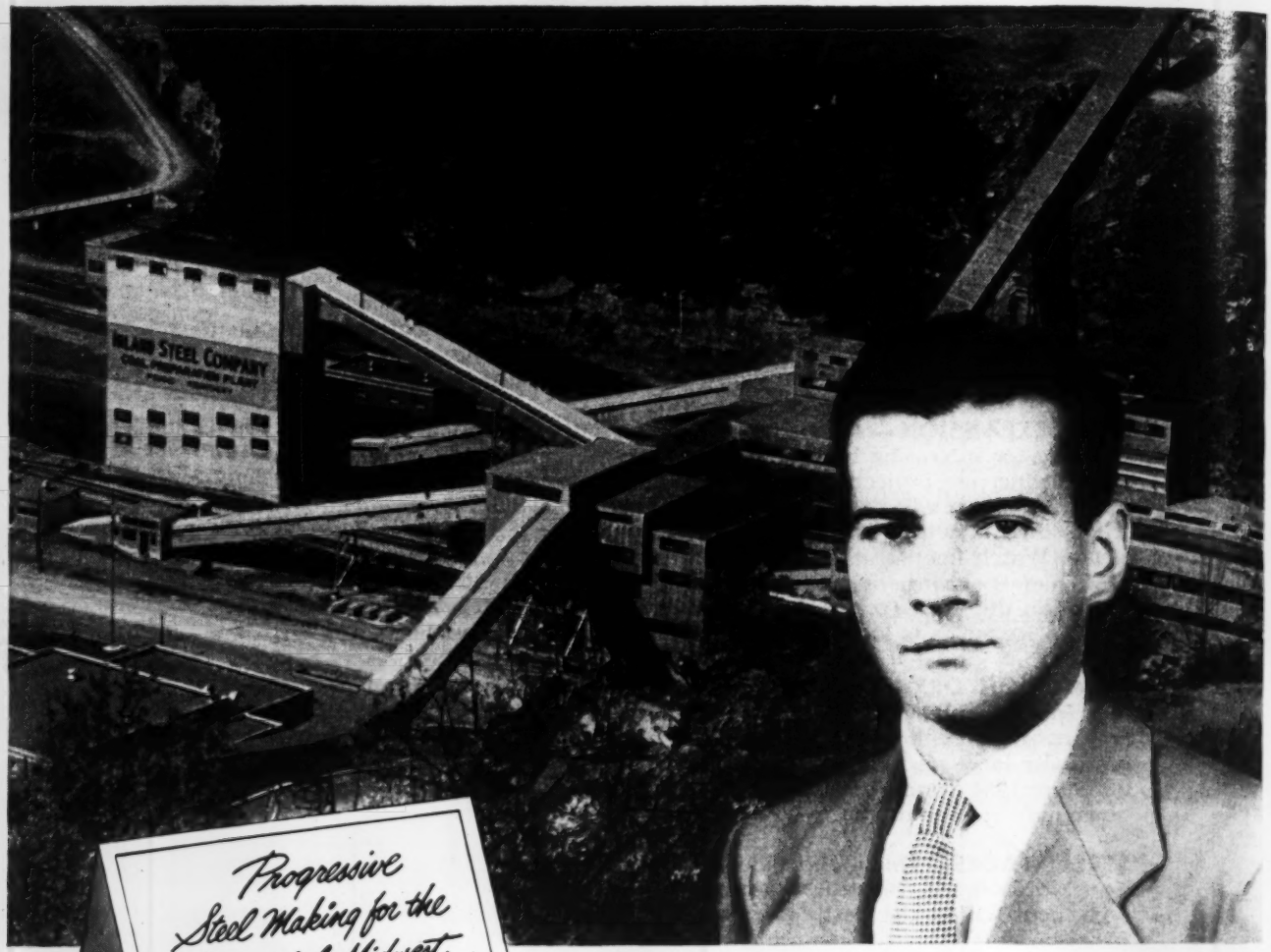

Progressive Steel Making for the Industrial Midwest

"WE GIVE OUR COAL A BATH

to improve our steel!"

"I'm Dick Jimenez, Preparation Engineer at Inland's new coal preparation plant in Price, Kentucky. Our job here is to provide a clean, uniform grade of coal with a low ash content for the Inland coke ovens. Poor coal... coal with varying degrees of slate mixed in... results in inefficient and undependable blast furnace operation. And today it's more important than ever that those blast furnaces be as productive as possible."

This coal preparation plant was recently put into operation as part of Inland's continuing program of modernization and expansion. This constant improvement of every phase of steelmaking is further evidence that Midwest steel users can put their confidence in Inland as a progressive and dependable source of steel in peace and war.

INLAND

Products: Sheets, Strips, Tin Mill Products, Bars, Plates, Structural Shapes, Sheet Piling, Reinforcing Bars, Pig Iron, Rails and Track Accessories, Coal Chemicals.

INLAND STEEL COMPANY

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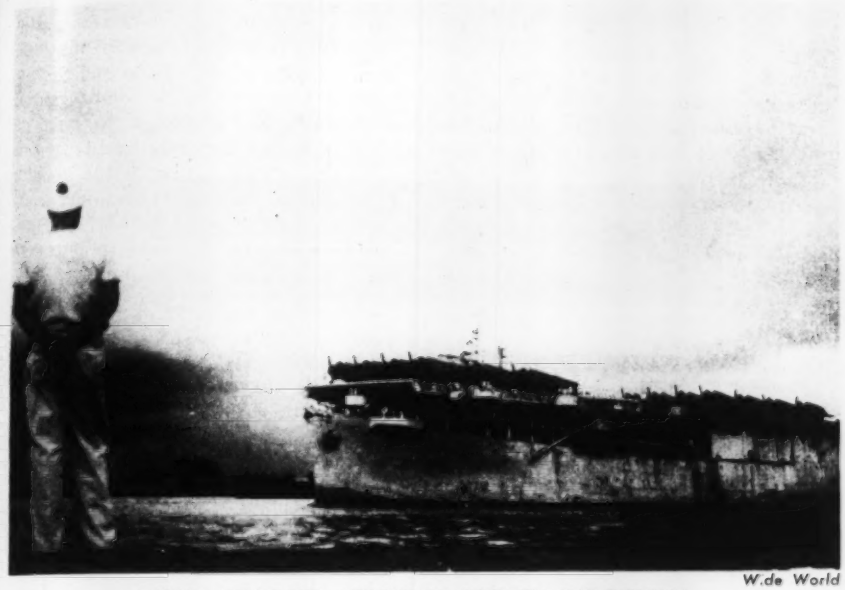

W.de World

NAVY HELLCATS ARRIVE IN FRENCH INDOCHINA
. . . as Asiatic war enters wider phase, requiring our—

Rearmament Plans To Be Raised

More billions for defense, faster conversion to military production, tighter supplies for civilian output expected to follow China's activity in North Korea

CHIEF news development for the metalworking industries last week—outweighing even the elections—was the involvement of the Chinese in the Korean war. With its implications that the Russians may be getting ready to lift the curtain on World War III, interest in the rearmament program is intensified.

The new military developments eliminate the prospects for a leisurely rearmament program. It means full steam ahead. More billions will be appropriated for defense, more industry will be converted to war production and at an accelerated pace, and shortages of materials for civilian industry may materialize more rapidly than has been anticipated.

But Not Immediately—For the first quarter, the materials outlook doesn't appear too bad. Military steel requirements for the first quarter are now estimated at around 800,000 tons, or little more than the 765,000 tons being taken for military purposes in the current quarter. That's caused by the time required to get the heavier production lines going.

Limitation of civilian production—automobiles, refrigerators and similar items is not expected in the first quarter.

It's possible that they can be staved off through the second quarter.

It'll Get Worse—But such limitation orders are expected to go into effect at latest by July 1. Current estimates—not final—are that the defense program will take 12 to 15 per cent of steel output in the third quarter and 25 per cent in the fourth period.

National Production Authority, while unwilling to clamp new controls on industry before they are actually needed, continues to plan against the worst that might be expected.

Fewer High Alloys — Watch for tightening in alloy steels. These soon may become practically unavailable for nonrated work. Look for revival of lean alloys, along the lines of the NE steels of World War II. A conservation order affecting alloying materials is under study.

Wanted: More Plates—NPA's Iron & Steel Division is hoping that steel producers voluntarily will raise plate production to around 600,000 tons a month by January, when the freight car allocations go into effect. If not, a production order aimed at building up plate production may be issued.

Meanwhile, NPA continues to study the sheet supply-demand situation closely. An increase in plate production probably would bring about a decrease in sheet output.

How Much for AEC?—First estimates of requirements for the atomic energy program, which now get DO ratings on par with the Defense Department, hover around 16,000 to 18,000 tons a month. These may be increased later to include heavy steel for the new reactor plant in Idaho and for the proposed hydrogen bomb plant for which no site is disclosed.

Got Steel Troubles? Tell NPA About Them

HAVING TROUBLE getting steel—particularly for your civilian products? If so, tell your problem to the National Production Authority's Small Business Division, either in the Washington headquarters or in any of the Commerce Department's field offices.

The NPA, acting on assurances from the steel industry that for the present there is enough steel for all defense and essential civilian purposes, has effected this setup: Its Small Business Division looks into complaints, and makes recommendations to the NPA Industry Operations Division, which, in turn, calls on the proper industry division for action.

In the case of steel, the unit that acts is the NPA Iron & Steel Division. For other materials write the Copper, Aluminum and other appropriate divisions. Those divisions rely on co-operative action from the producers. They telephone a few producers, or warehouses, until they find one who can supply the needed material.

Though no definition of essentiality has been set up, Small Business tries to use fair judgment. It turned down a request for aluminum for the manufacture of linoleum display racks; it decided linoleum could be displayed without cutting into the supply of critical aluminum.

Small Business construes the word "essential" as covering an extremely wide variety of steel uses, and it will continue to take this view until steel supplies become tighter.

Warehouses To Get Steel

NPA's chief instrument to insure steel supplies for small business firms

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became effective last week with issuance of Order M-6. This requires steel producers to allot to their warehouse customers proportionate percentages of each steel product based on average monthly shipments to the warehouses during the first nine months of 1950.

That means warehouses will receive about 17 per cent of the entire steel production based on statistics of the American Iron & Steel Institute, which reported warehouses received 17.2 per cent of all steel produced in the first seven months of the year.

Plus Rated Orders — Such allotments will be in addition to shipments made to warehouses to cover their defense rated orders. Shipments to warehouses will be in the same product mix as in the first nine months of this year if that is possible after steel producers have filled defense requirements.

No Price Control—Originally the order during its formatory stage, as disclosed by Administrator Harrison in an interview with a national magazine, contained a provision calling on the warehouses to refrain from making any increases in their selling prices which they will be in a position to do because of government action in guaranteeing their supplies of scarce steel products. Harrison, in announcing the order, apparently had in mind the fact that NPA has no power to control prices: He simply called on the warehouses "to hold the line against inflation by making every effort to maintain normal price relationships on steel products between mill and warehouse."

More Continuous Casting

Low-cost steelmaking facilities nearer to realization, says B&W chairman

CONTINUOUS casting of steel could presently be applied to about 15 per cent of the nation's output and improvements now being perfected will increase its application to between 25 and 30 per cent of steel production. That is what Isaac Harter, chairman of Babcock & Wilcox Tube Co., Beaver Falls, Pa., told the American Academy of Arts & Sciences in Boston last week.

Pilot plant for continuous casting is located at B&W's works in Beaver Falls, Pa., where the company is working with Republic Steel Corp. to bring the process to the point where it can be applied by industry. The goal is to reduce the cost of steelmaking and make possible the construction of steel mills for making moderate quantities of steel without expending all the money needed for conventional plants.

Bigger Sections Coming—Mr. Harter says it now is possible to cast oval cross sections of 25 to 40 square inches by the continuous casting method. This size, he points out, lends itself well to rolling into small bars, narrow-width strip, rounds for wire products and many other items. During the next year there will be tested a new mold which will make it possible to produce a casting with a cross section of 100 square inches, suitable for rolling into 26-inch strip in a continuous sheet mill. This mold will also be constructed so that it can be enlarged even further.

Advice for New England—In New England's quest for steelmaking facilities, he points out that raw materials at economical prices may be hard to get for some time and the investment needed for a nonintegrated mill would be one-third to half as high as for an integrated mill. Scrap probably would be available locally in sufficient volume to support continuous casting operations. Mr. Harter advised New England industry to consider continuous casting.

Ford Will Manufacture B-36 Engines in Chicago Plant

FORD will take over the facilities in the government-owned aircraft engine plant in Chicago for the manufacture of Pratt & Whitney Wasp Major engines for the B-36 bomber.

Brig. Gen. P. W. Smith, chief of the procurement division of the Air Materiel Command, U. S. Air Force, and Henry Ford II, president of Ford Motor Co., signed letter contracts to get the program started. Definitive contracts should be negotiated by the first of the year. Ford will produce the engines under a license arrangement with United Aircraft Corp.'s Pratt & Whitney Division, Hartford, Conn.

Ford will take possession of the plant and the facilities it selects, inventory the plant and its contents and repair, modify or rehabilitate the plant and facilities as well as acquire new facilities.

Production is expected to get under way in about 18 months. The plant is the same one that Chrysler used to produce Wright Cyclone engines during the last war.

Ford Aircraft Engine Division, one of six divisions in the newly formed manufacturing group headed by vice-president John Dykstra, will operate the Chicago plant. Maynard T. Murray is general manager of the Aircraft Engine Division. Pratt & Whitney will give Ford technical and manufacturing data and technical assistance before production begins.

Wide World

ANOTHER BIG ONE: This $3.5-million ore-carrying freighter, the largest of any kind ever built in Canada, is under construction at the Port Weller dry dock, near the Welland canal in Ontario. The carrier will be one of the largest to ply the Great Lakes. It is 654 feet long. Inland Steel's *Wilfred Sykes*, world's largest ore carrier, is 678 feet long

WHETHER ORE SHIPMENTS REACH 80 MILLION TONS DEPENDS ON WEATHER

. . . but next year the pressure will be on carriers to deliver even more

Ore Shipments May Hit 80 Million Tons

Weather permitting, the Great Lakes carriers will deliver enough iron ore this season to keep steel plants operating full tilt. All-rail shipments rise

THE WEATHER will have a lot to do with how much steel you get.

For the weather affects Great Lakes iron ore shipments, and ore is a hop, skip and jump from steel. The steel industry needs about 84 million gross tons of ore a year to produce 95 or 96 million net tons of ingots.

In the Lap of the Gods—Weather permitting, the ore boats on the Great Lakes will wind up the 1950 season late this month or early in December by bringing 80 million tons to lower Lake ports. As of Nov. 6, the carriers had hauled 72,079,597 tons, compared with 68,338,086 tons at the same time last year. Another 3 million tons will be hauled this year all-rail, principally by U. S. Steel Corp. That figure is unusually high. The cost of shipping all-rail from upper Lake ports to Pittsburgh is about $1.30 a ton higher than by the Lake-rail combination.

Weather permitting, ore stocks at docks and furnaces as of next Apr. 1—when the 1951 season should be getting started—will be about 16 million tons, compared with 20,864,000 tons at the same time in 1950. Although 16 million tons is low, it will be adequate if the ore carriers can get a good start early next April. The 1950 season got off on the wrong foot when weather delayed the start.

Too Much Strain?—In 1951 when the steel industry will strain to better its 1950 production peak, the pressure will be on the Great Lakes ore fleet to deliver even more than the 80 million tons it hopes to carry this year. Although ten new ore carriers are now or soon will be on order, none will be of any great help until 1952. That means that the present 264 American lakes ore vessels, supplemented by about 20 Canadian carriers that can be leased during the season, will have to carry the load in 1951. The American boats have a trip capacity of 2,622,750 tons. Weather permitting, they can do the job, ore men predict.

The problem of weather will be of a little less weight by 1952 when new shipping is in service. Cleveland-Cliffs Iron Co. has one ore vessel on order, Pickands Mather & Co. one, Pittsburgh Steamship Co. three, Bradley Transportation Co. one, Columbia Transportation Co. two and Hutchinson & Co. one. M. A. Hanna Co. will soon announce a contract award for the tenth vessel.

Blast Furnace Rate High

Blast furnaces operated at a higher rate in September than in August but produced a smaller tonnage of pig iron, ferromanganese and spiegeleisen because of the shorter month. Total blast furnace output in the latest month reported was 5,697,123 tons at 96.9 per cent of capacity, compared with 5,770,363 tons at 94.8 per cent of capacity in the preceding month.

Cumulative total for the first nine months is 48,479,870 tons and tops the corresponding total for 1949 by 2.8 million tons. Blast furnaces operations average 90.6 per cent of capacity in the period and a year ago the nine-month average was 86.5 per cent.

If operations are maintained for the rest of the year at about the same pace as they were in the third quarter a new annual total will be set by a comfortable margin. The existing annual record is 62,072,683 tons set in 1944, leaving less than 14 million tons to go before a new high is reached.

Collier Leaves Gray Iron Society

Raymond L. Collier, executive vice president of the Gray Iron Founders' Society Inc., Cleveland, resigned. He plans to re-enter the trade association field with which he has been identified for more than 25 years. Donald H. Workman was appointed by the Gray Iron Founder's board of directors to serve as acting executive vice president.

USS Subsidiaries Merge

Carnegie-Illinois, Delaware corporation, coal units become U. S. Steel Co.

CARNEGIE, a name dominant in the steel industry for 80 years, will undergo an eclipse Jan. 1. Carnegie-Illinois Steel Corp., largest operating unit of U. S. Steel, will be merged with three other subsidiaries to form a single operating company. The new company will be called the United States Steel Co. It will be a wholly owned subsidiary of United States Steel Corp. and will be housed in the new office building now being erected for U. S. Steel in Pittsburgh.

Combining with Carnegie-Illinois to form the new company will be H. C. Frick Coke Co., United States Coal & Coke Co. and the United States Steel Corp. of Delaware.

Simplification—The move is being undertaken to bring about a simplification of the corporate structure of U. S. Steel, says Chairman Irving S. Olds.

Benjamin F. Fairless will be president of the new United States Steel Co. and will continue as president

UNIVERSITY OF MICHIGAN LIBRARIES

of the United States Steel Corp. He now is president of the United States Steel Corp. of Delaware.

Other principal executives of the single operating company will consist of five executive vice presidents: Clifford F. Hood, operations; David F. Austin, commercial; Roger M. Blough, law and secretarial; Malcolm W. Reed, engineering; George M. Rooney, accounting.

Hood Becomes Vice Chairman—Mr. Hood is now president of Carnegie-Illinois. Messrs. Austin, Reed and Rooney are vice presidents of U. S. Steel Corp. of Delaware, and Mr. Blough is secretary and general solicitor of that subsidiary. The president and five executive vice president will constitute an executive committee for the new operating company, with Mr. Fairless as chairman and Mr. Hood as vice chairman.

Carnegie Name Dropped — After Jan. 1, the sales office of Carnegie-Illinois will be conducted in the name of the United States Steel Co. The new program does not affect other subsiidaries of the corporation, according to the official announcement, although some speculation that the other subsidiaries eventually may be brought into the operating company is voiced.

Industry in Itself—Carnegie-Illinois has about 22 million tons of steel ingot capacity, approximately two thirds of U. S. Steel's total. The company's capacity exceeds that of all of the United Kingdom or any other country in the world with the possible exception of Russia.

Frick and United States Coal and Coke last year produced more than 15 million tons of coal and combined will be the second largest coal producer in the country, topped only by Pittsburgh Consolidation.

United States Steel Corp. of Delaware is a managerial company with only a few hundred employees. It has no steelmaking capacity. It was organized to co-ordinate the operations of the U. S. Steel subsidiaries.

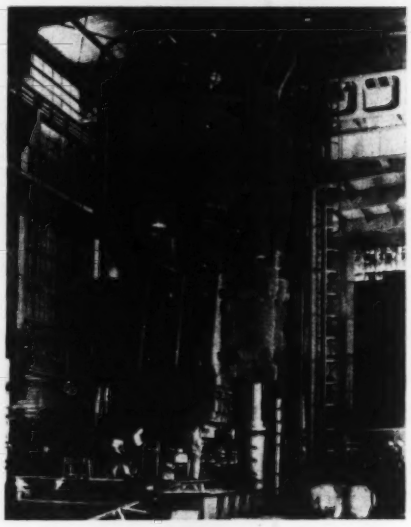
Going a Little Too Far for Steel

Charles Herbert Sleeman developed a bizarre plan to obtain scarce steel. But his plan backfired and he faces a two-year prison term.

Operator of a small construction company at Tulsa, Okla., Sleeman posed as an Army officer charged with procuring materials for an atomic energy project. He sent telegrams from Washington to various steel producers under the name of Capt. A. B. Wright, indicating he was authorized to place orders for steel casings. The telegrams were followed by an order to Jones & Laughlin Steel Corp. of $10,000 worth of casings on an order form especially printed for the deal and signed "Capt. A. B. Wright, Chief Executive Office, Procurement Division, No. 6 Atomic Research Area J-A-2." Shipping and inspection orders were wired.

J. & L entered the order but also started a check into the identity of Captain Wright. Washington never heard of him. J & L then referred the case to the FBI and Sleeman was taken into custody, tried and convicted.

Somewhere in Russia: 30,000-Ton Forging Press



ALUMINUM spar cap forgings, 33 feet long, originally machined from extruded sections weighing 517 pounds before and 176 pounds afterward, were produced in this 30,000-ton German hydraulic forging press. Only 22 pounds of metal were required to be machined from the finished forgings. Completed shortly before war's end, the huge press was later appropriated by Russia. Working with press builders, Air Force engineers now have a $200 million press program rolling and will build at least one similar type of press with a 75,000-ton rating. Being erected at the USAF manufacturing methods pilot plant at Adrian, Mich., operated by Gerity-Michigan Corp. (STEEL, Oct. 30, p. 42) is a 15,000-ton press

U. S. vs. Russia

Koppers official says Soviet may challenge America's position as steelmaker

COAL and iron ore resources of the Soviet Union make it possible for that nation ultimately to challenge the United States as world leader in steel production.

That disturbing possibility was voiced by Dr. W. C. Rueckel, vice president, Koppers Co. Inc., before a meeting of the Blast Furnace & Coke Association of the Chicago District and the Eastern States Blast Furnace & Coke Oven Association in Chicago Nov. 3.

Ore and Coal—The United States, Dr. Rueckel says, achieved its enviable position through the availability of both high-grade coal and iron ore resources. But rapid depletion of the rich domestic ore deposits in recent years soon will make mandatory the tapping of the newly discovered Canadian and South American supplies if broad expansion of steelmaking is to continue in this country. North America should barter coal for ore with South America, thinks Dr. Rueckel.

We need to know the coal and iron ore resources in the world to formulate a policy, he says. Our world position in steel is affected by treaties which give certain areas to certain countries and from a raw materials viewpoint this disposition can either jeopardize or consolidate our steelmaking position.

More Than Furnaces Needed—An expansion of 10 million tons in steelmaking capacity requires an increase of 15 million tons of coal and from 15 to 18 million tons of ore, plus commensurate transportation facilities to handle these tonnages.

More Aluminum Expansion

Coal and gas generated electricity may open a new era in aluminum production, permit capacity to be expanded by a billion pounds. NSRB Chairman Symington and aluminum producers are studying plans to build aluminum plants adjacent to power plants using gas and coal; higher generating costs would be offset by lower transportation costs.

The government may assist financially in the expansion through loans, loan guarantees and accelerated amortization. Considering the program are the three big established producers—Alcoa, Reynolds and Kaiser—and three newcomers—Apex Smelting Co., National Aluminum Reduction Co. and Harvey Machine Co.

Cost of the smallest practical aluminum plant will range from $40 million to $45 million. A provision being considered is that the government take back the plants if they don't prove economically feasible in five years.

Reynolds in Mexico?

An aluminum plant there is in the company's broad expansion plans, says Barnes

AN ALUMINUM PLANT in Mexico is in the broad expansion plans of Reynolds Metals Co., Louisville, T. Hall Barnes, vice president and manager of Reynolds Internacional says.

Mr. Barnes was accompanying a group of 10 Mexican officials and industrialists on a tour of Reynolds plants in the United States when he made the announcement in Hot Springs, Ark. "Although plans for a Reynolds plant in Mexico are still in the formative stage," he said, "we hope to establish a plant in the petroleum fields just south of the U.S.-Mexican border to manufacture fabricating material for the utensil industry. Pig aluminum from Arkansas probably would be used by such a plant which would be built to give Mexico the same aluminum products that are available in the U.S."

"Great Thing" for Mexico—Antonio C. Flores, director general of Mexican national finances, says the plant would be a "great thing" for Mexico, producing 40 million pounds of fabricating material yearly and involving an investment of about $20 million. Mr. Flores explained that he and other officials of the Mexican government and of Banco Nacional de Mexico are looking over Reynolds installations in the U.S. because establishment of a Reynolds plant in Mexico would require financial transactions with the Mexican government's international banking representatives.

Titanium Equipment Approved

Niles Rolling Mill Co., Niles, O., started a $500,000 expansion program that will include further work in developing processes for rolling titanium alloys. The first phase of the program will cost about $150,000. It is part of Sharon Steel Corp.'s $49 million long-range expansion. Niles is a subsidiary of Sharon.

Ekco Cuts Into Scissors

Ekco Products Co., Chicago, is now in the household scissors business. Its British subsidiary, Platers & Stampers Ltd., bought all of the shares in a company called Champion (Scissors) Ltd., Sheffield, England.

Arthur Keating, chairman of the board of Ekco and Platers & Stampers, says the newly acquired company has been in business since 1712. It was the largest producer of household scissors and manicure implements in England. Purchase of Champion by Platers & Stampers gives Ekco, the parent corporation, its initial entrance into Sheffield manufacture.

Power on the Peribonka

Aluminum Co. of Canada Ltd. is going to start construction immediately on a 200,000-horsepower generating station at Chute du Diable on the Peribonka river, principal waterway of the Lake St. John watershed. Plans are for the entire project to be finished in two years.

Baldt Steel Co. Property Sold

Chicago Bridge & Iron Co. bought the former Baldt Steel Co. property near New Castle, Del., to build a new plant for steel fabricating. J. Huber Denn, industrial commissioner of the Delaware Chamber of Commerce made the announcement. Chicago Bridge didn't indicate when it will start work nor what it will build. The company fabricates steel plates, makes various kinds of tanks, standpipes, gas holders and other products.

Precision Erecting Warehouse

Precision Drawn Steel Co., Camden, N. J., is erecting a plant addition to provide for storage of about 4000 tons of additional rough stock. Construction steel was fabricated by Belmont Iron Works, Eddystone, Pa. Paul W. Newcomb, Precision president, says the new structure will enable the company to unload incoming materials much faster.

Bay State Expands Still More

Bay State Abrasive Products Co., Westboro, Mass., will spend $100,000 for factory expansion and manufacturing equipment. The sum is in addition to $250,000 that was appropriated in May for a similar program that is being carried out. Contracts for additional work have already been let and work is in progress, including additional factory space of 6400 square feet to house a new tunnel kiln that was purchased.

GE Jets at Lockland, O.

General Electric Co. is expanding its jet engine manufacturing facilities at Lockland, O. C. W. LaPierre, manager of the Aircraft Gas Turbine Divisions, Lynn, Mass., says the company plans to get additional factory space in Lockland and to move its executive and engineering staffs from Lynn to Lockland. Aside from those shifts operations at Lynn and Everett, Mass., will not be changed. Operations at those places include manufacture of jet engine and turbosupercharger parts, assembly of the parts into complete engines and advanced laboratory research.

At Lockland GE's J-47 turbojets for Air Force planes are assembled from components supplied by nearly

Wide World

TEARING UP THE ROAD: Almost as easily as a saw will cut ice this "roadcutter" will rip up concrete. It was designed by Joy Mfg. Co., Pittsburgh, at the request of Cleveland Electric Illuminating Co. to reduce labor and speed up the operation of removing old road beds. Charles Ball, director of research for Joy, is beside the machine

280 subcontractors throughout the U. S. Production was started by GE in February, 1949.

Plants for Titanium Pigment

National Lead Co. has contracted for two new sulphuric acid plants. Chemical Construction Corp., New York, already broke ground on the projects. One of the plants will be in St. Louis, the other in Sayerville, N. Y. Both will have capacities in excess of 300 tons per day. Output of the plants will be used to expand National Lead Co.'s titanium pigment facilities.

Lockheed subsidiary. Besides its consumer line of cooking ware, Gem Ware makes castings of magnesium and aluminum for industrial users. Terms of the purchase were not revealed, but Gaines did acquire all physical assets including raw material. The company will operate as Gaines Co. It will retain the Gem Ware trademarks on cooking ware and other consumer goods.

As rapidly as it can be accomplished, the facilities of the Gaines plant will be expanded to meet the demand for specialized aircraft and hydraulics castings of magnesium and aluminum. Production of household utensils will continue on a reduced scale as long as allotments of aluminum permit consumer demand to be satisfied without jeopardizing the defense program.

$700,000 LOOK: Francis Daugherty Jr., president (left), and F. J. Stokes Jr., vice president in charge of production, look over architect's plans on the $700,000 plant expansion at F. J. Stokes Co., Philadelphia, Pa. The addition will enlarge present facilities for the manufacture of many Stokes machines: Freeze-drying and vacuum processing equipment, pharmaceutical equipment, tabletting, powder metal and plastics molding presses, high vacuum pumps and special machinery

C. H. Wheeler Stock Bought

Hamilton-Thomas Corp., Hamilton, O., acquired 98 per cent of the 12,000 capital shares of C. H. Wheeler Mfg. Co., Philadelphia. Purchase was made at $100 a share. Unpurchased shares are held by officers of Wheeler who will continue in their present capacities. Wheeler has assets of about $3 million and manufactures ship deck machinery and power utility equipment.

Frank Gaines Buys Gem Ware

Gem Ware Mfg. Co., Los Angeles, was purchased by Frank E. Gaines, founder of Aerol Co. Inc., now a

Hooker Finishes Up Expansion

New facilities for the increased production of caustic soda and chlorine at the Tacoma, Wash., plant of Hooker Electrochemical Co., Niagara Falls, N. Y., have been completed. Expansion consisted primarily of two circuits of the new Type S-3 electrolytic cells that have far greater capacity than the old cells replaced. Additions, too, were made for the handling of brine and for purifying and evaporating caustic soda.

Columbia Gets New Warehouse

Columbia Tool Steel Co., Chicago Heights, Ill., producer of high speed alloys and carbon tool steel for industrial production, completed its new $100,000 branch warehouse in Detroit. The company has moved into the new facility from a former Detroit location which it occupied for 20 years. The addition gives Columbia Tool Steel six warehouses in the central west, besides the producing plant at Chicago Heights. Other warehouses are in Chicago, Milwaukee, Cleveland, Cincinnati and St. Louis. The new 6000-square foot warehouse will stock about 2000 items of the standard types of tool steel.

Lucas-Milhaupt Doubles Output

Lucas-Milhaupt Engineering Co., Cudahy, Wis., concluded its program to double production of stress-relieved silver brazing and soldering preforms for the metalworking industry. Special equipment for fabricating the silver solder rings and washers consists of combined feeding, cutting and forming machines driven by variable speed motors designed for the operation. Speed control and braking of motors is achieved by a specially designed electronic control system. Also included in the expansion program are additional facilities for coining wire rings into washers between polished dies at 180,000 pounds pressure per square inch.

Olin Buys Into Harwid

Olin Industries Inc., East Alton, Ill., bought a substantial interest in Harwid Co., Cambridge, Mass., manufacturer of polyethylene film. The film is a fast growing plastic material used for packaging products like small machine parts, soap and frozen foods. John M. Olin, presiden of Olin, Harry H. Gilbert, Harwid board chairman, and R. Widmer Hubbs, Harwid president, made the announcement.

There will be no change in the Harwid management or sales distribution. Olin's interest in the film will complement its sale of cellophane. Olin's plant for production of cellophane is under construction at Ecusta Paper Corp., subsidiary of Olin Industries, at Pisgah Forest, N. C.

Ross to Get Extension Built

Ross Industries Corp., parent company for J. O. Ross Engineering Corp., manufacturer of air processing and drying equipment, awarded a contract for a plant expansion at High-

land Park, N. J., to H. K. Ferguson Co., industrial engineer and builder. Project will provide a 75,000-square foot extension, part of which will be used for offices and laboratories. The project will cost about $900,000, including equipment. It is scheduled for completion in 1951.

Westwick Foundry Sold

Gray iron foundry of John Westwick & Son Inc., Galena, Ill., was purchased by Joseph V. Shanley, president, and G. A. Shanley, secretary, of Garden City Foundry Co. Garden City's headquarters are in Chicago. It has gray iron foundries in Chicago and Stoughton, Wis. Operations are continuing under the Westwick name. Employment of about 125 is contemplated. Garden City acquired the plant to expand its output of light-to-medium and high tensile gray iron castings on a high production basis.

Nat'l Radiator To Build Plant

National Radiator Co. will build a $1-million plant on the outskirts of Altoona, Pa., that will serve as headquarters for sheet metal operations.

GM Buys Pneumatic Tool Plant

General Motors Corp., Detroit, bought the plant of Chicago Pneumatic Tool Co. in Detroit. The tool company's Detroit operations will be transferred to Utica, N. Y. Acquisition makes available to GM 145,000 square feet of building space, including a main building, a warehouse and heat-treating building adjoining the railroad tracks besides two other buildings on Amsterdam avenue in Detroit.

No Squeaks in Invisible Hinges

Volume of unfilled orders for invisible hinges is currently about 35 per cent higher than a year ago and represents a substantial backlog for Soss Mfg. Co.'s nonautomotive division, reports President Charles J. Soss. The Detroit company's orders are from the general building industry and from manufacturers of such widely diversified products as furniture, business machines, radios, television sets, sewing machines and caskets.

Drilling Machine Business Sold

Chester Bland, president of Ohio Electric Mfg. Co., announces purchase of all tools, dies, patents and rights to manufacture the complete line of Taylor & Fenn drilling machines. Taylor & Fenn, located in Hartford, Conn., was established in 1846 and is one of the country's pioneer machine tool builders. Tools and dies for building the T & F lines are being transferred to Ohio's Cleveland plant where the drilling machines will be manufactured.

Ohio Electric's products include nail-making machines, lifting magnets and magnet control equipment, electric cable hoists and fractional horsepower motors.

Texaco Completes Beacon Lab

Newest major unit in The Texas Co.'s research expansion program was completed at the company's Beacon, N. Y., laboratories, Michael Halpern, Texaco vice president in charge of refining, announces. The building affords 55,000 square feet of added research area and increases by about 40 per cent the facilities of Texaco's main research center, the Beacon Laboratories, one of 28 research and quality control laboratories.

NEA

ANVIL CHORUS: These youngsters, listening to Roland Robbins, archeologist for the First Iron Works Association, Saugus, Mass., were pictured just before they deluged him with a chorus of questions. He described the early days of iron making in America. The 500-pound iron hammer-head in front of them was hauled from the banks of the Saugus river. It was used at the anvil of America's first iron works over three centuries ago to pound red hot bars into shape. Other relics unearthed by an archeological crew include iron rings, nails, tools and kitchen utensils (STEEL, June 19, p. 67)

Petroleum Industry Spending Tops $2 Billion

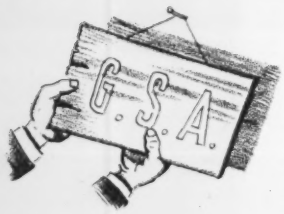
MORE THAN $2 billion for development, modernization and expansion of its facilities will be spent by the petroleum industry this year, the fifth consecutive year in which outlays topped the $2 billion figure. A survey by the American Petroleum Institute shows U. S. oil companies will spend $2172 million for domestic expenditures and $2.4 billion including overseas investments. This year's domestic outlay is a little less than the $2.3 billion record set in 1948.

As in preceding years the biggest expenditure will involve searching for and developing necessary oil and natural gas reserves and supplies. More than half this year's capital outlay or $1360 million will be spent in this branch of the industry, compared with $1457 million in 1949 and a 1946-1949 average of $1341 million.

Transportation estimates total $324 million. Pipe lines take a major portion of this outlay as follows: Crude oil lines $120 million, product lines $74 million, and natural gas lines $91 million. Natural gas lines outlays are far above the $49 million spent for this purpose in 1949 and the $41 million 1946-1949 average. Product pipe line expenditures show a sharp increase over the $41 million invested last year.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*



Hangs Out Shingle

Soothing Radio Ear

Scrap for Mexico

20-Knot Freighter

Bethlehem gets first contract on new fast cargo ship . . .GSA may soon be doing business under Defense Act . . . Mexico will get scrap . . . .Scrap institute files petition with ICC . . .

GENERAL Services Administration may hang out its shingle soon to do business under the Defense Production Act. It hopes to announce within a couple of weeks the regulations under which it will fulfill its functions under the act. These are of wide interest to industry, since they include: 1. Installation of additional facilities in plants owned by the government and installation of government-owned equipment in privately owned plants; 2. purchase of metals, minerals and liquid fuel, over and above stockpile requirements for government use and for resale; and 3. guarantee of loans to prime contractors and subcontractors.

Less Radiation from Radio, TV...

One of the great accomplishments of the radio and television industry over the past year has been a redesign of receiving sets to reduce the amount of radiation, say Federal Communications Commission engineers. A year ago, after the FCC had put the finger on the industry for creating a large proportion of the interference under which its products had to operate, a drive was started. On Nov. 15 under the aegis of the Radio and Television Manufacturers Association, the industry will hold an all-day meeting with the FCC to report on the progress already made and to discuss unsolved interference problems.

After Many a Vain Attempt . . .

Petition for a reduction of approximately 20 per cent in existing freight rates on ferrous scrap in southern territory was filed with the Interstate Commerce Commission by the Institute of Scrap Iron & Steel Inc. Petitions for similar reductions in all other territories are to be filed shortly. The method of procedure was decided on after the institute had worked vainly for more than a year directly with the railroads to obtain such reductions.

Nobody Loses, Except . . .

Another herald of the coming attempt to throw all possible obstacles in the path of lobbyists representing industry is a complaint by three "liberal" Democratic senators—Thomas of Utah, Murray of Montana, and Kilgore of West Virginia—based on findings of the Democratic majority of the House Lobby Investigating Committee (STEEL, Nov. 6, p. 62). Commenting on the report, a statement issued jointly by the three senators says: "It is a wonderful arrangement. Nobody loses except the United States Treasury, the taxpayer, and the corporate stockholders."

The senators wrote to George J. Schoeneman, commissioner of the Bureau of Internal Revenue, requesting information as to criteria used to determine deductibility of lobbying expenses. Their intention is to lay the foundation for a law to outlaw such deductions in the future.

Boron, Titanium, Zirconium . . .

For use on a nonexclusive, royalty-free basis are more Atomic Energy Commission patents listed in the Patent Office's register of patents for license and sale. One patent, No. 2,528,454, describes a method of depositing a boron coating by heating metal in a gaseous boron hydride atmosphere. A list of 17 patents and three applications is in Release No. 315, available from AEC.

Available at AEC depositary libraries are other declassified and unclassified AEC papers.

French Like Our Foundries . . .

At the end of a busy five-week round of American foundries at least one member of a French team, brought to the U. S. under ECA sponsorship, thought France could double the productivity of workers in its steel and malleable foundries by using American methods. Said Georges Daugenet: "One lesson I learned is that when a molder sticks to molding, he does more and better work than our French molders who not only put up molds but pour them, get their own sand, shake out the molds and so on."

Maurice Marcel Flour, leader of the team and a technician at Aciertes d'herson a Hirson, thought modernization of French foundries could be accomplished by organizing work to co-ordinate time and motion.

Pressing Scrap Requirements . . .

Although the Office of International Trade has not set any ferrous scrap export quotas since the first half of 1950, in the interest of conserving the scrap supply at home, it validated six applications to take care of pressing requirements in a number of countries which regularly rely on the United States for scrap. The tonnage to be exported totals around 30,000 tons—to go mostly to Mexico.

Bethlehem Gets Ship Award . . .

Bethlehem Steel Co.'s Shipbuilding Division will prepare the bidding and working plans and related data on the new National Defense type fast cargo ship (Design C4-s-1a) for the Maritime Administration, Vice Adm. E. L. Cochrane, maritime administrator says. The award to Bethlehem was made after negotiations with the company to lower the original bid price, says the administrator. The present negotiated price is $1,219,000; the original price was $1,270,000.

The need for the new vessel has been expressed by Admiral Cochrane on several occasions. Vessels now in the reserve fleet are mostly 10-knot Liberties. There are only 100 15-knot Victories still in the reserve; 136 were broken out for use in the Korean campaign.

European Nations Face Labor Problems

Britain seeks a solution to a manpower shortage. German unions renew fight for more voice in management. French workers want more money

GREAT BRITAIN, West Germany and France are wrestling with serious labor problems.

In Britain, 250,000 additional workers are required to implement the armament program. In the industrial Midlands, some 45,000 jobs can't be filled in civilian production. A drive is starting to get at least 12,000 women and 10,500 people under 21 into the factories of the area. So hard hit by the manpower shortage are the steel mills that some are operating on only two shifts instead of three.

Labor unions in Germany are renewing their fight for more voice in management of industry. Unemployment is dropping and union power is increasing correspondingly. Labor chiefs want their representatives on the board of directors or some other management council in every plant where they have worker members. The representative would not have to be an employee of the company; he would be strictly a union man. On that point, management gags. It has come up with a counter plan that would give a labor representative limited voice provided the representative is an employee of the company on whose board he serves.

The heat's on for higher wages in France. The cost of living has inched upward since the outbreak of the Korean war and increased military difficulties in Indo-China. Iron and steel workers have taken due note that their counterparts in Luxemburg have just had a 5 per cent hike. Belgian steel workers may get one, too.

Controls May Return in Britain

The manpower shortage in Britain may revive labor controls.

Controls on distribution of steel and other materials are virtually certain to return. Panic buying of steel tangled supply channels to such an extent that some companies, particularly automotive, have had to shut down for short periods. Sheets are especially scarce.

Both export and domestic demand for steel is heavy. Commonwealth export markets, notably in Australia, are markedly active. Home needs are unusually pressing because of a revival in the shipbuilding industry. Shipyards are now humming with civilian and naval work. Yards such as Vickers-Armstrong Ltd. are building tankers for American oil companies. Vickers-Armstrong has a $7 million contract from Standard Oil of New Jersey to build two, 26,500 ton units.

NEA

RETREADS: A Greek workman puts the finishing touches on a rebuilt freight car, finished in one of the biggest railway car shops in Europe. Erected with Marshall Plan funds, the car shop began operating early in October. It is turning out 80 rebuilt cars a month. The factory is expected to add about 350 cars monthly to the badly depleted Greek railways after installation of machine tools and other equipment has been completed

Jeopardized by the steel shortage is Britain's railroad program. The nationalized railways plans to standardize on 12 types of locomotives to replace the 400 designs now used. Under the program some 160 new locomotives are to be built in 1951. Makers of other types of railroad equipment are busy but not operating at capacity because of the steel shortage.

Ruhr Labor Gets British Support

The German unions have the support of the British in their drive for more control of company management. The owners are wooing American backing.

The battle is coming to a climax because the steel industry is in the throes of reorganization—by Allied order—and now would be psychologically ideal for labor to start a flanking movement on management.

The future setup of Ruhr industries is still murky, partly because of the labor-management stalemate. Another cause of the delay is this: The Western Foreign ministers in their recent New York meeting confidentially agreed to reserve to the Allies certain control right in German coal, steel, banking, film and I.G. Farben industries even after sovereignty has been returned to the Bonn government. The Germans are keeping the agreement secret and dragging their feet on coal and steel industry reorganization because they hope to weaken its content in future negotiation.

Incoming steel orders still surpass current production, but foreign contracts amount to only 10 per cent of total bookings, compared to 30 per cent in August. Severest shortages are in sheets and strip. Nonferrous metals are also becoming increasingly scarce.

Vereinigte Stahlwerke plans to reopen August-Thyssen Huette which has an annual capacity of 1,650,000 net tons of steel. Vereinigte also hopes to build a new wide strip mill with a capacity 50 per cent greater than that of the facility dismantled. The new unit would produce 880,000 tons a year. Financing would come entirely from domestic funds. It will take two or three years to build the mill.

Sweden, which had threatened to cut its ore shipments to Germany, agreed to continue deliveries at the same rate as now. Prices are up 15 per cent, though.

World market prices for steel are rising again. German exporters are asking $90-$100 per metric ton f.o.b. for steel bars, $115-$130 for heavy plates, $120-$135 for medium plates, $180-$200 for sheets and strip, $95-$105 for wire rods and $47-$50 for pig iron.

Inflation Threatens in France

The pressure on wages is just one aspect of increasing inflation in France.

Booming raw materials prices are sending up the cost at French imports and boosting the cost of living. The 1951 budget will probably show a $771 million deficit. The government may be forced to boost freight rates on its nationalized railroads which are losing about $343 million a year, almost as much as the gov-

ernment's total income tax take.

Not all is dark, though. French iron and steel exports are rising, and hit a high of nearly 300,000 net tons in September. The upward trend is continuing. Auto production is also rising. Some 35,000 cars and trucks are being turned out monthly.

With Regrets

Mr. K. Headlam-Morley, Sec'y
The Iron & Steel Institute
4 Grosvenor Gardens
London, S.W.1, England

Dear Mr. Headlam-Morley:

For many years I have been proud to be a member of your great organization. In view of the fact, however, that your iron and steel industry is no longer a free institution but is part of a socialistic empire, I no longer care to be associated with it and hereby regretfully tender my resignation as a member.

Sincerely yours,
C. M. White, president
Republic Steel Corp.

Norway Mines Niobium

Norway will soon start mining niobium, a rare mineral used in making high-temperature resistant steel alloys for jet engines and gas turHbines.

Some large deposits of niobium-rich limestone variety called "sovitt" have been discovered at Holla in the central district of Telemark.

African Platinum Output Rises

Following a meteoric rise in production in the past three years, South Africa has become the second largest producer of platinum in the world; it has an output approaching half the entire consumption of the western nations.

Only Russia today exceeds the Union's figures.

Since 1947, South Africa's output nearly doubled. In that year, production was 56,000 ounces. This year it will be around 100,000 ounces. The entire platinum yield is obtained from two mines in the Transvaal.

South Africa is not so well off in other metals. Total steel production this year will be only 565,000 tons, although demand is for 1.3 million tons.

The difference between the two figures can't be made up, though, because of the huge demand elsewhere in the world.

CF & I Improvements To Cost $26.2 Million

Included in the modernization program: Two new open hearths, rebuilding of a blast furnace, a new rolling mill. By 1952 firm's annual capacity will be 1,865,000 tons

A $26.2 MILLION modernization and improvement program is planned for Colorado Fuel & Iron Corp.'s Pueblo, Colo., steel plant and mining properties. Included are:

Two new open-hearth furnaces that will add 325,000 tons of steel capacity to the present capacity of 1,320,000 tons, making a total of 1,645,000 tons of capacity at Pueblo.

Rebuilding of "A" blast furnaces which will add 45,000 tons of pig iron to the present capacity of 850,000 tons, making a total of 895,000 tons.

A new high-speed 10-inch rolling mill that will provide a wide range of rounds, flats, squares, rebars, angles and other products. (The mill will be installed in the location of the old rod mill; a modern high-speed rod mill has been in operation at Pueblo since the latter part of 1949.)

West of Trinidad—A new coal mine, to include the latest type of equipment, to be opened in southern Colorado, about 27 miles west of Trinidad, above the company's present Frederick mine. (The new property will be known as the Allen mine and will supplement the increasing need for coking coal at the Pueblo steel plant. Announcement had previously been made that a new mine was under investigation.)

Open-hearth capacity was increased at the Buffalo, N. Y., plant to a total of 220,000 tons so total producing capacity of the corporation, on completion of the present Pueblo program—sometime in 1952—will be 1,865,000 tons annually. The two new furnaces at Pueblo will be placed in a new location designed to accommodate installation of additional furnaces at a later date, if desirable.

Two Good Reasons—C. W. Meyers, president of CF & I, says the decision was made by the board of directors based on the urgency of doing everything possible to meet the accelerated demand for steel for the national defense program and to meet the growing western steel requirements.

A certain proportion of the company's products is now controlled by priority regulations, but every effort is being made to distribute the present available tonnage in the most equitable manner possible.

At a meeting in New York the board of directors re-elected all the present officers of the corporation for the ensuing year. All members of the board were re-elected at the annual meeting of the stockholders held at the general offices of the corporation in Denver, Colo. The board: Charles Allen Jr., A. C. Bekaert, Franklin Berwin, Alwin F. Franz, Jacob L. Holtzmann, Samuel D. Lunt, Carl W. Meyers, Charles G. Terry, G. C. Textor, J. B. Welborn and W. M. White.

The officers are: Mr. Allen, chairman of the board; Mr. Terry, chairman of the finance committee; Mr. Meyers, president; Mr. Franz, executive vice president; Mr. Bekaert, vice president in charge of finance; F. S. Jones, vice president in charge of sales; J. J. Martin, vice president in charge of operations; Mr. Berwin, vice president; H. C. Crout, treasurer; D. C. McGrew, secretary; Earl D. Page, controller.

C F & I is proud of its co-operative safety record at the Pueblo plant: 133 days or 5,598,367 man-hours without a lost-time accident.

Military Job for Conveyors

The belt conveyor is about ready to be used as a method of speeding up the flow of battlefield supplies, says

Charity Day

HOW MUCH production time does your company lose each year through solicitations for charitable drives?

Line Material Co.'s southern plant in Birmingham considered that question and came up with a plan for "Good Neighbor Day" to make charitable collections more efficient, more lucrative.

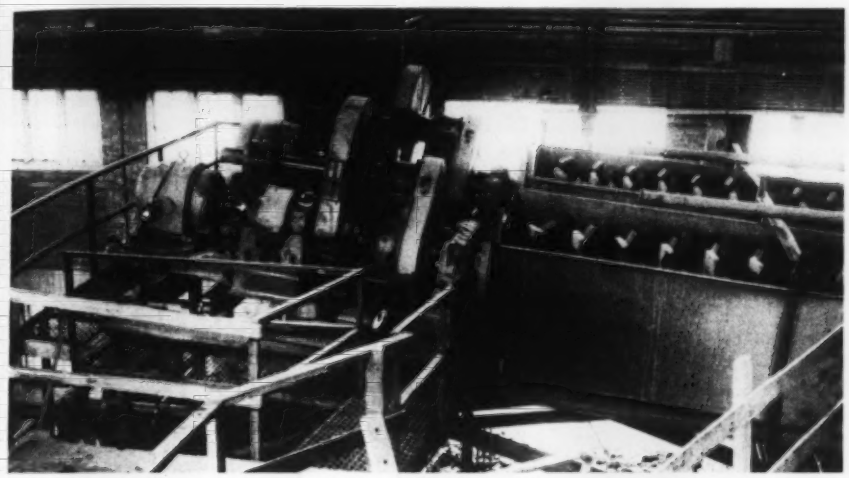
Company employees—on a voluntary basis—put in five hours' overtime on Good Neighbor day, were paid time and a half. The money went into a charity fund. Line Material added to the fund one day's profits from regular operations. An employee committee conducts the affairs of the fund and determines what percentage of the money will be allotted each drive. The Birmingham plant hopes to make the day an annual event, to cut down the number of employee solicitations, save time and give more money to the charitable organizations.

Harold Von Thaden, vice president and general manager of Robins Engineers Division of Hewitt-Robins Inc., New York. He spoke before the Westinghouse Materials Handling Conference in Buffalo.

What are the advantages?

Mr. Von Thaden says a supply conveyor is: Easier and quicker to build than a truck road; simpler to operate, more economical, faster and would carry greater loads than a fleet of trucks; and would present less of a target than a truck-filled road, also in case of a bombing it could be repaired faster.

A 30-mile belt conveyor system, manned by 100 soldier-technicians, would carry 5 tons of supply every minute at a continuous speed of 5 miles per hour. To do the same job by vehicle, 400 trucks, manned by 1200 drivers, would have to be loaded at a rate of one a minute. Mr. Von Thaden predicts that the present ratio of seven rear echelon men for one at the front could be reduced to five to one with conveyors.



LOG WASHER: This washer does not wash logs but it does wash east Texas iron ore in the Lone Star Steel Co.'s beneficiating plant near Daingerfield, Tex. It is one of four being installed to replace present washers and blade mills and is part of Lone Star's improvement and expansion program. Beneficiating capacity will be 200 tons per hour, more than enough to supply the company's 1200-ton blast furnace

Lone Star Spreads Out

The steel company's expansion will give east Texas its first integrated plant

TEXANS down Dallas way have long wanted a steel industry based on the ores in the hills some 140 miles eastward in east Texas. Furnace foundations dating back as much as three quarters of a century are evidence of many an unsuccessful attempt.

Now it looks as though President Eugene B. Germany of the Lone Star Steel Co. will bring east Texas its first integrated steel plant designed to supply the southwestern oil industry with tubular goods—and possibly plates. Mr. Germany's plans call for construction of an open-hearth shop with four furnaces tapping an average of 188 tons each or with an annual capacity of 500,000 tons, plus necessary soaking pits for holding the steel ingots at rolling temperature.

Coming Up — A 2-high, 100-inch wide modified plate mill with 44-inch diameter rolls would be used to break down ingots. This material then would be further reduced into pipe skelp on a hot Steckel mill with coiling furnaces. This mill would have 27-inch work rolls with 49-inch backup rolls, having a face of 72 inches. Skelp up to 66 inches wide would be rolled.

Two electric-weld pipe mills with annual capacity of 350,000 tons are contemplated. One would handle diameters from 1½ to 6 inches and the other sizes from 4 to 16 inches. The overlap in capacities would permit production of popular sizes such as 4-inch line pipe and 5 to 5½ inch oil well casing on either or both mills. Induction heat treating equipment would be added for producing stronger casing required for deeper wells.

In His Own Backyard—Mr. Germany anticipates no selling problem since he finds that 85 per cent of all the oil country tubular goods are consumed within 400 miles of Lone Star, Tex. Annual requirements for casing and tubing in Texas and adjoining states are 870,000 tons. Projects, actual or planned, for long distance delivery of gas and oil will require 1 million tons of line pipe. Besides, there is a steady demand for 400,000 tons of the smaller sizes of line pipe within the oil fields.

Lone Star got its start late in 1941 at the outbreak of World War II when the government financed the construction of an ore beneficiating plant, a sintering plant, 78 coke ovens, a 1200-ton blast furnace and auxiliary equipment. Plans for five open hearths, a 44-inch blooming mill, a 90-inch plate mill and an 18-inch structural mill for rolling shell steel and light structurals were shelved in February, 1943.

Bootstrap Survival—Previously operating under a lease arrangement, Lone Star acquired title to the plant on Jan. 1, 1948. At first, the company found the going rough. When Lone Star got $75 a ton for pig iron during the 1948 scarcity, the premium price helped pull it out of the hole. Today, the company is making money selling No. 2 foundry iron at $45.50—competitive with Birmingham—and plowing a considerable chunk of that cash back into improvements.

An additional fleet of new diesel-powered trucks is on order for hauling ore about two miles from the pits to the beneficiating plant, about 2½ miles by rail from the furnace. Ore is limonite and siderite. The latter is found at the bottom of the ore formation and is capped by the limonite which in turn is topped by loose overburden, mostly sand. Proved nearby ore reserves are 41,295,968 tons. Coal reserves about 240 miles away in Oklahoma total 23,071,914 tons.

Face Lifting—Wartime wood construction at the beneficiating plant is being replaced by steel. Four new log washers of latest design are being installed to wash and scrub the ore.

Equipment also is being added for recovering fines under 3/16-inch heretofore sluiced into the tailings pond. Improvements at the blast furnace include lining the hearth with carbon.

A new cast iron pressure pipe plant with capacity of 80,000 tons annually has just gone into operation. Pipe in sizes from 4 to 12 inches is cast in four DeLavaud centrifugal machines, transported by conveyor to a continuous annealing furnace, dipped in tar, weighed and given a final inspection.

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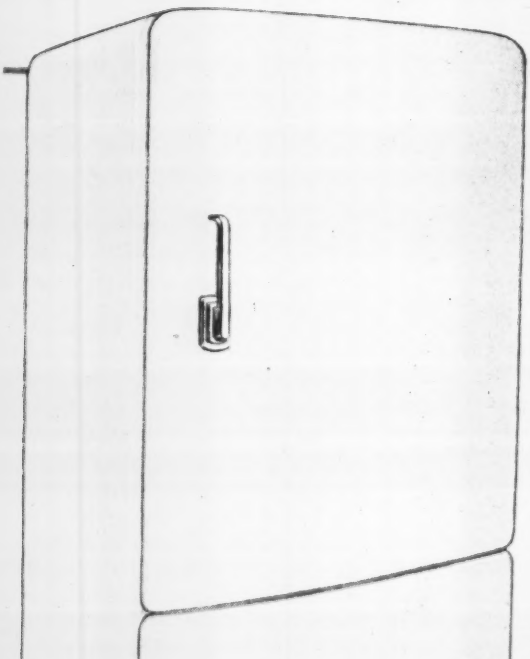
A Case History for Steel Fabricators

HOW N-A-X HIGH-TENSILE STEEL CUTS COSTS



Refrigerator Manufacturer Found that High Strength Sheet Steel Saved 98c on Each Unit's Cost Over Carbon Steel

A refrigerator company specified N-A-X HIGH-TENSILE steel for its wrapper sheets. The higher strength of this low-alloy sheet resulted in drastic weight savings. Its inherently finer surface texture reduced finishing and painting costs. In addition to manufacturing advantages, N-A-X HIGH-TENSILE steel gives longer life and greater consumer acceptance.

N-A-X HIGH-TENSILE STEEL *effected these economies:*

- 14 lbs. of framing eliminated per unit.
- Faster production rates, fewer man hours in metal finishing department.
- Fewer sanding discs.
- Fewer rejections from paint conveyor line.
- An average of 5% less paint used per unit.

MAKE A TON OF SHEET STEEL GO FARTHER

N-A-X HIGH-TENSILE STEEL

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division — Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Zig-zag springs for auto seat cushion win more acceptance in 1951 models. But the coil spring people come up with a competitive answer

DETROIT

INTRODUCTION of the "zig-zag" seat cushion spring on 1949 bodies in the General Motors "A" series, furnished by Fisher Body to Chevrolet, Pontiac and Oldsmobile, was the culmination of a success story which at one time was so near failure as to cause its inventor, W. H. Neely, to contemplate the river. Now it is bouncing ahead to still greater acceptance on the 1951 GM models, being adapted to cushion backs as well as seats in "A" bodies, going into seats of the "B" bodies as well as the brand new O-B (Olds-Buick) bodies scheduled to make their bow shortly on the Olds 88 and Buick Special. (Talk now is that the Olds 88, with heavier weight, latest type of V-8 engine and snappy new body, will be GM's hottest thing for '51).

From Germany—Actually, the zig-zag wire spring, or convolute or sinusoidal as some engineers erroneously call it, came to this country about 20 years ago from Germany and found its first use in furniture. Mr. Neely—he is called Bill in Detroit and Harold in Cleveland—envisioned its great possibilities in the automotive field and set out to develop machinery to form the desired shape at high speed and automatically. That was no cinch and it is only in the last few years that machine designers and tooling experts working with him have come up with what looks like the answer.

Bill Neely is president and general manager of Universal Wire Spring Co., which has three plants in Cleveland, the last in suburban Bedford getting under way only last July. He made his first sale to Willys and the design is standard in all Willys jeeps, trucks and station wagons. Barney Roos, long the top engineering expert at Willys, realized the cost-saving and freight-saving potentialities, and gave his O. K. The big break, however, did not come until 1948 when Fisher Body moved into the picture. License agreements were signed with Neely, providing that he supply a certain percentage of the "A" body requirements, and build for Fisher the necessary machinery to make the remainder.

No Coils — Basically, what the spring arrangement involves is a series of flat corrugated wires, conforming to the top contour of the cushion and hooked to a welded stamped steel base or frame. No coils are required, the spring support coming from the cantilever action of the "snaked" wires running from front to back. A typical cushion has 17 of the formed wires across its surface, with special shapes at the ends. Conventional padding and upholstery material are applied over the spring, leaving the entire underside open to provide footroom for rearseat passengers.

Two potent selling points have been demonstrated: First, the manufacturing cost is much less—possibly 20-25 per cent—than the old arrangement of nested coils, wrapped in burlap and tied together with cross-wires and attached to a steel frame; and second, appreciable freight savings result from the fact the corrugated springs can be packed together tightly in cartons and shipped knocked-down to outlying assembly plants. It is no trick to pack 700 complete sets of springs and frames in a boxcar.

One objection to the corrugated spring might be its somewhat higher frequency or deflection rate, running somewhere around 70 per minute, against 60 for the coil spring assembly. However, spring engineers reportedly have agreed fairly generally that rates between 60 and 100 are satisfactory for automotive applications.

Rapid Welding—Universal's No. 1 plant in Cleveland is devoted entirely to Willys output. Plant 2 on Euclid avenue makes front seat springs only for Fisher Body and can bat out 22,000 sets a week without too much trouble, thanks to a 40 per cent step-up in the speed of its ten wire corrugators effected in the last six months. Plant 3 in Bedford, comprising three spacious brick buildings formerly occupied by Jack & Heintz Industries, is now the general headquarters and engineering development center. Neely and his executive assistant, C. E. Smith, are now working overtime getting the bugs out of this operation and think they can get as much out of six corrugators, whirring away at 80-85 feet of formed wire per minute, as they could out of the ten in plant 2. Equipment showpieces at the plant are two multiple spot welders which make the hundred-odd welds required in a cushion base or back in about half a minute. The machines have tables with two sets of fixtures, rotated under the welding guns

VERY COSMOPOLITAN: The 1951 Lincoln Cosmopolitan has new wrap-around bumpers, a new grille, redesigned tail lamps and side moldings extending the entire length of the automobile. Its V-8 engine has 154 horsepower

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through a Geneva mechanism, the one being loaded while the other is being "fired."

GM apparently thinks the corrugated spring is "it," for this construction has been extended to cushions used by GM Holden's Ltd. in Australia and Vauxhall in England. The '51 Ford will use the same principle although not the same supplier. Falls Spring & Wire Co. and American Metal Products Co. are the Ford vendors, operating under license from No-Sag Spring Co., Detroit.

Competitors' Answer—Don't think the suppliers of coil spring cushions have been sitting idly by. Their experimental engineers have been moving under forced draft to come up with something competitive pricewise. L. A. Young Spring & Wire Co. showed body engineers its answer in Detroit during their meeting Nov. 1-3. This was a design in which all welding has been eliminated, as well as 12 of the usual 48 spring coils in the cushion. Frame is tubular, machine stapled to pressed-wood base or backing. Then, instead of the tedious burlap-wrapping of each individual coil before inserting it into the assembly, the entire frame, coil and backing unit "in the white" is dipped into a rubber adhesive and transferred to a flocking chamber where a blast of rayon flock covers every inch of exposed surface. Result is a neat bit of sound deadening and an exceptionally slick looking cushion innard. It does not lick the problem of excessive space required for shipping, although other advantages may outweigh this deficiency. A similar construction has been devised for seat backs.

Incidentally, Universal is thinking about flocking its corrugated spring, on the theory that the added cost might be desirable, say for Cadillac, as positive insurance against the least whisper from the spring elements in action.

Sees Larger Aluminum Use

Clay Bedford, executive vice president of Kaiser-Frazer, told the body engineers at one of their sessions he figured the total estimated annual potential automotive use for aluminum at roughly 2 billion pounds, although such a realization might be 15 years away. He broke this down into three groups of items which his advanced engineering department has been studying: Those which have immediate application, since they have been used by at least one automotive manufacturer—452 million pounds; those for which conversion to aluminum appears immediately practical—63 million; and those which look practical in the more distant future—1526 million.

While most prospective uses are for chassis parts—cylinder heads, flywheel housings, transmission cases and extensions, bumpers and the like—K-F engineers have carried out research on things like die-cast aluminum frames for doors, decklids and instrument panels, all covered with formed sheet steel in the finished part. The Kaiser line now uses a die-cast aluminum garnish molding, requiring 12 pounds per car. Other suggestions for body applications Textured aluminum for parts like scuff plates; bright aluminum finish to replace stainless steel, and substitution of aluminum for zinc die castings in hardware, the latter color-anodized to harmonize with interiors.

Mr. Bedford said the modern automobile needs about one horsepower for every 30 pounds of dry weight, and an engine costs about $1 per horsepower to build, admitting that once the engine has been produced the horsepower can be increased for less than $1 per unit. However, he reckoned that for each pound of weight saving in a vehicle, roughly 3 1/3 cents can be deducted from engine cost through such weight elimination, in long-range planning.

Current military demands for hopped-up aluminum production seem to make consideration of additional automotive usage rather academic, and as a matter of fact the use of aluminum in automobile building was more prevalent 25 years ago than it is today. Says Mr. Bedford: "Subsequent rise in price of aluminum, and failure due to lack of proper alloys, burned engineering thinking so severely that strong traces of it are felt even today." Still he regards the future of the light metal in the automotive industry optimistically.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
May	721,161	508,101
June	897,864	523,689
Six Months	3,941,883	3,034,055
July	746,771	604,351
August	842,304	678,092
September	760,808	657,073
October	805,000*	601,021
November	.....	474,731
December	.....	384,318
Total	.....	6,533,641

Weekly Estimates

Week Ended	1950	1949
Oct. 21	188,323	143,049
Oct. 28	188,200	141,725
Nov. 4	187,207	116,699
Nov. 11	183,000	114,856

Estimates by Ward's Automotive Reports

* Preliminary.

More Two-Car Families

George Romney, personable young vice president of Nash-Kelvinator, disclosed additional details of his company's thinking prior to introduction of its Rambler model, which was described as a "sma'ler," not "small," car. Significantly, the rate of new one-car families has increased since the war less rapidly than the rate of those owning two cars, which has almost doubled, reflecting the changing pattern of use created by the drift from the city to the suburbs where the automobile may be the only means of transportation. Reasoned Nash: In terms of dollar depreciation and ability to pay, it is one thing to have a medium-priced car with a lower-cost No. 2 car, and quite another to have two medium or high-cost cars. The difference might well be sufficient to prevent many suburban households from buying a second car, and hence the lower-priced but almost full-sized Rambler.

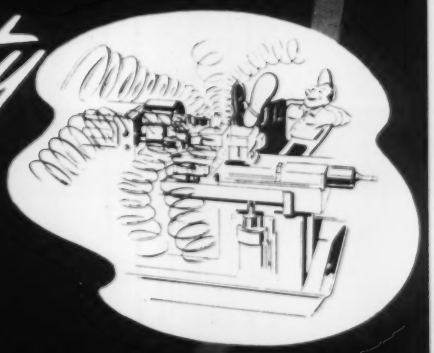
For 20 years the trend in the high-volume low-priced field has been to more power, size and weight. A typical Big Three model between 1929 and 1950 gained in weight from 2100 pounds to more than 3000, pushed out wheelbase from 104 to 114 inches and overall length from 154 to 197 inches, while its horsepower rose from about 26 to 90. Nash is seeking to get back to where the smaller car was in 1929, without sacrificing rider comfort and at the same time greatly improving gasoline economy.

Chrysler Promotes Colbert

At 45, L. L. "Tex" Colbert, elevated to the presidency of Chrysler Corp., becomes the youngest top executive in the industry. He has been president of the Dodge Division since 1945, joining Chrysler in 1933 and coming up through the legal ranks. His production training came under the tutelage of K. T. Keller, president, who now moves up to chairman of the board. During the war he managed the Dodge Chicago aircraft engine plant and since then has concentrated more on manufacturing than legal details. Hale fellow well met, he bring the corporation a refreshing viewpoint that augurs well for their mutual future.

Extra Toughness

Better Machinability



· LATROBE ·

DESEGATIZED BRAND*

HIGH SPEED STEELS

HI CARBON - HI CHROME DIE STEELS

Fewer Heat Treat Losses

LATROBE ELECTRIC STEEL COMPANY

LATROBE, PENNSYLVANIA

Branch Offices and Warehouses located in principal cities.

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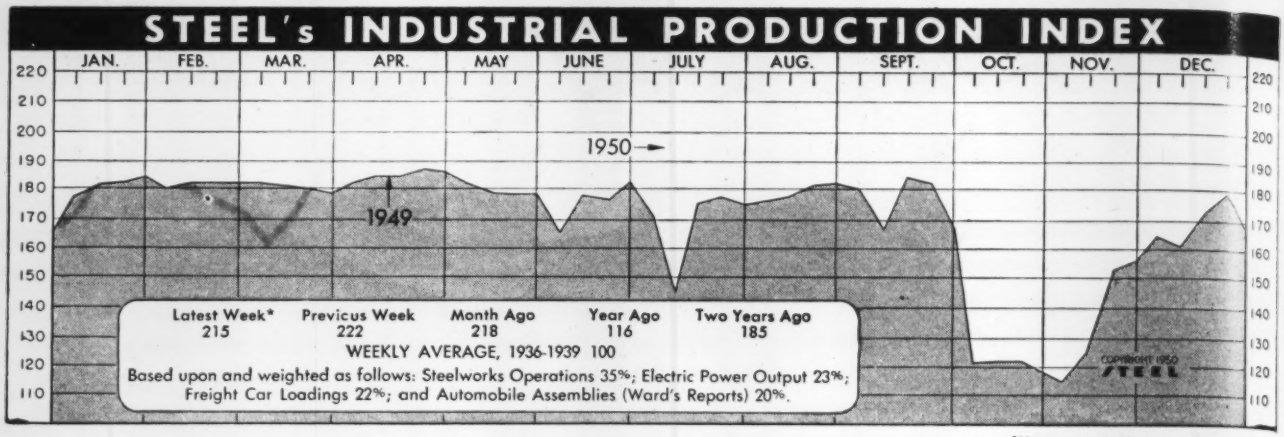
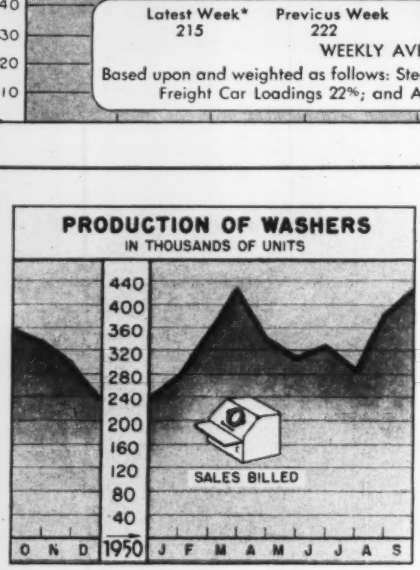
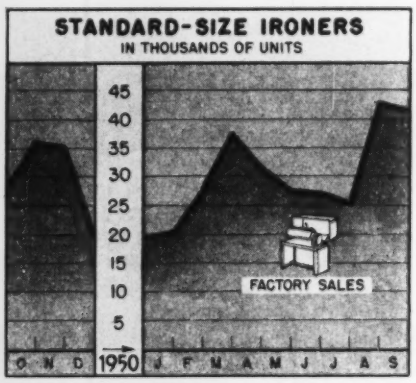
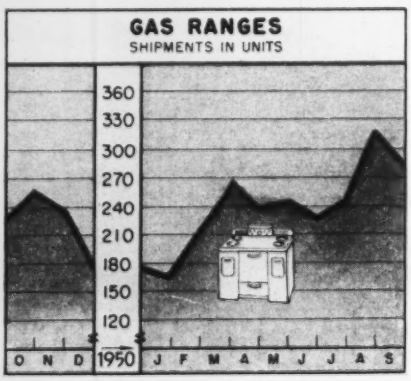

STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
220 210 200 190 180 170 160 150 140 130 120 110
1950
1949
Latest Week* 215
Previous Week 222
Month Ago 218
Year Ago 116
Two Years Ago 185
WEEKLY AVERAGE, 1936-1939 100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1950 STEEL

Week ended Nov. 4 (preliminary).







Charts—Copyright 1950. STEEL

Household Washers

Sales Billed—Units

	1950	1949	1948
Jan.	275,576	172,400	360,445
Feb.	342,967	201,300	367,909
Mar.	423,802	242,500	408,512
Apr.	333,072	192,500	402,257
May	304,640	211,700	377,895
June	325,217	260,700	392,496
July	282,261	200,900	326,181
Aug.	381,452	323,789	362,169
Sept.	424,043	357,281	433,919
Oct.	.....	333,728	382,400
Nov.	.....	298,717	319,300
Dec.	.....	237,591	183,700
Totals	.....	3,033,106	4,317,183

American Washer & Ironer Mfrs. Assoc.

Standard-Size Ironers

Factory Sales—Units

	1950	1949	1948
Jan.	20,300	28,300	40,192
Feb.	27,600	28,400	51,651
Mar.	37,800	23,800	53,686
Apr.	31,600	18,100	47,319
May	27,400	19,500	44,954
June	27,100	21,100	32,767
July	25,100	17,700	26,679
Aug.	42,700	32,300	35,203
Sept.	41,400	27,700	37,308
Oct.	.....	36,045	38,517
Nov.	.....	35,000	42,000
Dec.	.....	19,400	26,000
Totals		307,345	476,860

American Washer & Ironer Mfrs. Assoc.

Gas Ranges

Shipments in Units

	1950	1949	1948
Jan.	165,000	106,700	222,800
Feb.	209,000	117,700	228,400
Mar.	264,000	151,500	252,100
Apr.	239,100	150,100	245,300
May	242,800	151,600	257,800
June	224,700	162,200	250,500
July	254,800	125,800	203,600
Aug.	318,000	206,100	250,100
Sept.	281,400	227,300	248,500
Oct.	.....	257,500	257,500
Nov.	.....	237,400	202,300
Dec.	.....	175,700	131,100

Gas Appliance Mfrs. Assoc.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction Oct.23	Furnaces, W. Air...Oct.16	Ranges, Elec. Oct.30
Durable Goods Nov.6	Gray Iron Oct.30	Refrigerators Oct.23
Employ., Metalwkg..Oct.23	Indus. Produc. Nov.6	Steel Cast. Oct.28
Employ., Steel Oct.23	Machine Tools Oct.30	Steel Forgings ....Oct. 30
Fab. Struc. Steel..Nov.6	Malleable Iron Oct.30	Steel Shipments Oct.30
Fdry. Equip. Orders Nov.6	Price Indexes Nov.6	Trucks, Elec. Ind. ..Jan.2
Freight Cars Oct.16	Purchasing Power ..Oct.2	Vacuum Cleaners ..Nov.6
Furnaces, Indus. ...Oct.16	Radio, TV Aug.14	Wages, Metalwkg...Oct.28

Second Best Month for Washers

Factory sales of standard-size washers in September were the second highest in history and pushed the total for the first nine months above that for all 1949. Shipments in September aggregated 424,043 units, second only to the 433,919 shipped in September, 1948, the American Home Laundry Manufacturers' Association says.

January-September sales aggregated 3,093,030 washers, or 2 per cent more than the 3,033,106 units sold in all 1949 and 43 per cent above sales in the first nine months last year.

Automatic tumbler dryer sales in the nine months reached 215,144 units and are more than double the 105,727 units sold in all 1949. September sales were 31,399 units, 2.8 per cent below the 32,318 units sold in August but 190 per cent more than 10,806 reported for September last year.

Ironer sales in the January-September period were 281,000 units, only 8.6 per cent less than sales in all 1949 but 29.5 per cent greater than shipments in the like period last year. Ironer sales in September totaled 41,400 and were 3 per cent below those for August.

Gas Range Shipments Ease

Domestic gas range shipments in September totaled 281,400 units and brought the three quarter total to 2,191,100 units, the Gas Appliance Manufacturers Association reports. September's shipments were 11.5 per cent below those for August but were 23.8 per cent higher than in September a year ago. Three quarter shipments this year are 56.6 per cent higher than in the corresponding period of 1949. A total for the first nine months for electric stove shipments is not yet available but in the first eight months 1,213,600 electric ranges were shipped, topping the like 1949 total by 73.1 per cent.

The Business Trend

With the smoke clearing from the political arena there'll be more orders and directives pouring out of Washington as defense planning takes first place

DEVELOPMENTS in the allocation control picture were minor last week but since the elections were in the center of the stage it was not surprising. Optimists who hoped that government controls would be soft-pedaled as the Korean war news improved had their hopes dashed with the latest developments on that front.

All of the sounds coming out of Washington make it pretty clear that not only are more controls coming but they will be with us for some time. Pronouncements about expected price increases by government economists make it appear that a strong case is being built up for price controls. In view of the existing legislation on this score, wage controls should be hard to omit if prices are battened down but—love will find a way.

A little more than a week ago M. S. Szymczak, Federal Reserve Board governor said the U. S. can avoid direct controls such as price-wage curbs and rationing. His view that direct controls work best over a short period and would become increasingly inefficient causing more and more economic distortions as years go on agrees with those held by many business men. Whether FRB's existing credit curbs plus any new ones to be taken will be enough to stem the rising price tide is open to debate. This point may never be proved because there is considerable pressure for controls particularly on prices.

NSRB Chairman Symington warned business men that if they raise prices the government may force them to cancel the increases. He said recent price rises have made government imposed ceilings more probable but not yet certain.

Industrial production broke its stride in the week ended Nov. 4 and STEEL's industrial production index fell off to a preliminary 215 per cent of the 1936-1939 average. A drop in the steelmaking rate and another in auto assemblies were responsible for the decline. Carloadings and electric power generation remain at high levels.

Strike Trims Steel Rate . . .

A wildcat strike in Bethlehem Steel's Lackawanna plant pushed the steelmaking rate temporarily from its lofty perch in the week ended Nov. 4. The rate that week dropped to 98.5 per cent of capacity. Last week the industry again scaled the heights and a new output mark was chalked up wiping out the one set two weeks earlier.

Changeovers and Shortages . . .

Automotive industry's outturn dropped more than 12,000 units in the week ended Nov. 4 to 175,707 from 188,200 in the preceding week. Labor trouble, shortages and changeovers to new models all contributed to the production drop. Model switching always means slower assembly operations for a while but some of the builders who have already shifted are finding the going rougher than usual in getting their output back to pre-changeover levels. Several of the big volume producers are going to make their model changes

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	98.5	102.5	101.5	12.0
	Electric Power Distributed (million kilowatt hours)	6,550	6,562	6,514	5,435
	Bituminous Coal Production (daily av.—1000 tons)	1,933	1,958	1,904	451
	Petroleum Production (daily av.—1000 bbl)	5,900	5,895	5,872	5,136
	Construction Volume (ENR—Unit $1,000,000)	$199.7	$245.1	$288.0	$169.9
	Automobile and Truck Output (Ward's—number units)	175,707	188,200	177,853	116,699
	*Dates on request. †1950 weekly capacity is 1,928,721 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (unit—1000 cars)	883†	888	864	579
	Business Failures (Dun & Bradstreet, number)	165	160	154	196
	Money in Circulation (in millions of dollars)‡	$27,219	$27,121	$27,188	$27,382
	Department Store Sales (changes from like wk. a yr. ago)‡	+5%	+3%	+6%	−7%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$16,288	$16,118	$17,035	$14,011
	Federal Gross Debt (billions)	$256.8	$256.9	$256.4	$256.9
	Bond Volume, NYSE (millions)	$17.6	$19.3	$23.9	$18.7
	Stocks Sales, NYSE (thousands of shares)	9,223	11,018	13,426	7,226
	Loans and Investments (billions)†	$69.2	$68.8	$68.8	$66.8
	United States Gov't. Obligations Held (millions)†	$33,729	$33,580	$33,845	$37,388
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	157.76	157.62	157.28	152.52
	STEEL's Nonferrous Metal Price Index‡	246.4	234.9	223.1	170.6
	All Commodities†	169.4	168.9	168.8	151.5
	Metals and Metal Products†	178.5	178.1	177.1	166.9
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

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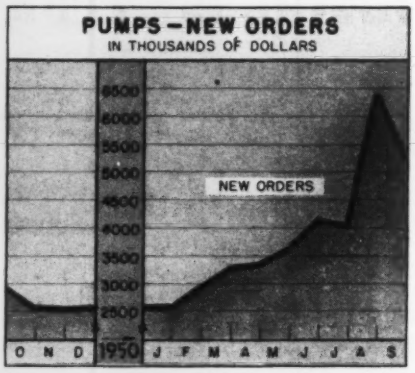
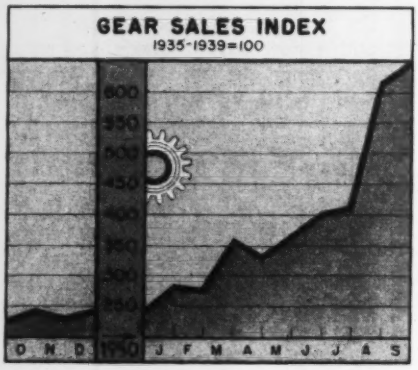


Pumps, New Orders
In Thousands of Dollars

	1950	1949	1948
Jan.	2,586	3,390	3,819
Feb.	2,938	3,247	3,635
Mar.	3,313	3,593	4,703
Apr.	3,376	2,699	4,312
May	3,668	2,775	3,724
June	4,153	3,019	3,512
July	4,080	3,358	4,075
Aug.	6,429	3,767	4,520
Sept.	5,191	2,914	3,474
Oct.	....	2,539	3,571
Nov.	....	5,525	3,580
Dec.	....	2,560	4,263
Total	....	36,386	47,188

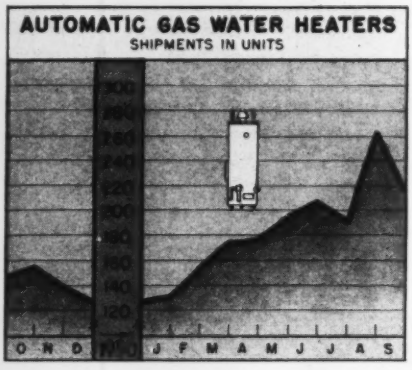
Hydraulic Institute



Gear Sales Index
1935—1939=100

	1950	1949	1948
January	280.2	320.7	346.8
February	272.9	282.3	324.4
March	358.4	299.1	389.8
April	328.6	339.0	320.9
May	363.1	250.1	283.6
June	401.0	227.8	324.1
July	410.7	193.1	384.4
August	617.4	262.0	335.6
September	654.5	224.9	320.4
October	....	242.3	333.3
November	....	230.7	309.0
December	....	242.8	325.9

American Gear Mfrs. Assoc.



Automatic Gas Water Heaters
Shipments in Units

	1950	1949	1948
Jan.	131,600	88,400	126,600
Feb.	154,000	84,500	110,900
Mar.	172,800	106,000	131,600
Apr.	176,400	115,200	134,100
May	195,200	120,200	118,600
June	205,400	132,200	122,000
July	197,500	114,400	121,300
Aug.	264,000	138,800	160,200
Sept.	215,000	147,300	149,300
Oct.	.....	154,200	127,500
Nov.	.....	138,300	109,000
Dec.	.....	126,500	88,900

Gas Appliance Mfrs. Assoc.

Charts—Copyright, 1950, STEEL

before the end of the year, cutting into industry totals.

Construction Volume Falls . . .

Engineering construction awards in the week ended Nov. 2 dropped to $199.7 million from $245.1 million in the preceding week. A $76.6 million drop to $29.3 million for industrial building from the preceding week's unusually high total more than wiped out gains in both private and public housing. Highway construction was also off in the the latest week.

Fewer Business Starts . . .

Dun & Bradstreet reports that new business incorporations in September fell to the lowest level in five years in September. Total for the month was 6274, smallest since September, 1945, when there were only 4826 in the first full month after the end of the war. September's total represents a 12.9 per cent drop from the 7201 incorporations reported in August. New stock company formations in the first nine months totaled 73,104, down 14.2 per cent from the total for the like period in 1949.

Consumer Credit Mounts . . .

Consumer installment credit outstanding rose $322 million in September to $13,329 million at the end of the month, the Federal Reserve Board reports. The advance reflects gains in automobile sale credit, other sale credit and installment loan balances. During the third quarter total installment credit increased by $1224 million compared with a gain of $776 million in the corresponding period a year ago.

Labor Pool Drying Up

Unemployed no longer an important source of defense workers, says Sawyer

UNEMPLOYED are all but ruled out as an important source of additional workers for defense industries, Commerce Secretary Sawyer says. The number of idle workers in the United States dropped from 2,341,000 in September to 1,940,000 in October as civilian and defense demands stepped up the need for workers. This figure is only half as large as it was a year ago and is only slightly above a year postwar low set in the fall of 1948.

Total employment reached an estimated 61,764,000 in October and was a good increase over September's 61,226,000. It was the highest employment figure ever recorded in October but fell short of the record of 62.4 million reached in August this year.

Employment figures for October reveal that for the first time since the end of World War II the armed forces are claiming a sizable number of young workers from the civilian manpower pool. Though the October employment increase was due largely to a fall pickup in farm activity, Commerce says, there was also an increase in the number of non-farm workers which was balanced out by subtractions caused by the reopening of schools and the speedup in draft and reserve calls.

October Was Busiest Month

Domestic new orders for National Cash Register Co., Dayton, O., were higher in October than in any other month in the company's history. "Ever since the start of the Korean war new orders have been piling up at an almost fantastic rate," says President Stanley C. Allyn.

New orders for accounting machines which currently constitute 40 per cent of all new orders show the biggest increase. Backlog is large for all the company's products with accounting machines and higher grade cash registers heading the list. Mr. Allyn reports that delivery can't be promised for some accounting machines for seven or eight months.

Big Office Equipment Backlog

Boosting the work-week from 40 to 50 hours still hasn't enabled Underwood Corp., New York, to produce office machines fast enough to meet incoming orders. The war-inspired flurry of orders dipped somewhat in September but the backlog went up during the month. The big backlog

means buyers must wait up to three months to buy certain models of Underwood office machines. Sales of the company's portable typewriter also have exceeded expectations and the backlog for these machines is rising rapidly.

Raw materials shortages haven't yet interrupted production. Underwood started work on a defense contract for the Springfield, Mass., ordnance district but this has not impeded production of office equipment. Earnings in the third quarter were $889,973, more than 50 per cent higher than in the like 1949 period.

TV Output Pace High

Television receivers were produced at an alltime record rate in October but the monthly total fell below that for the preceding month which covered a five-week period in Radio-Television Manufacturers Association's tabulations. The association's estimate which covers output by both member and nonmember companies shows 813,851 sets produced in October, compared with 817,157 in September. Total outturn for the first 10 months is 5,777,610. Early in the year a 5 million total for the year was regarded as very optimistic.

Radio set production which included home, auto and portable receivers was high in October totaling 1,413,563 sets. The ten month total for all radios is 11,481,823.

Philco Rides Appliance Boom

Through the third quarter at least Philco Corp., Philadelphia, made the most of the heavy appliance demand. Its sales for the period were greater than in any previous three months in the company's history, says President William Balderston. A year ago volume and income for the September quarter were held down by starting costs on the company's new television and radio line.

Philco's television output has been steadily increasing and a new production mark was set in the first week in November. Television and radio models were on allocation all fall and less than a single day's inventory exists in distributors' hand, Mr. Balderston says.

Since the government has indicated its intention of limiting amount of raw materials to be used in consumer durables, Philco is engaged in a broad study of substitute materials.

Earnings Picture Changes

A good profit for the nine months ended Sept. 30 is reported by Bohn Aluminum & Brass Corp., Detroit, contrasting sharply with the loss reported in the like period a year ago. Earnings in the third quarter were the best since the final quarter of 1948 despite charges to bring tax provisions for the nine months up to the new tax rates. Net profits for the first nine months totaled $888,432, compared with a $633,569 loss a year ago.

Sales in the third quarter totaled nearly $10.5 million and were the highest for any quarter since the end of the war. Volume of original equipment auto parts, aluminum extrusions and evaporators for refrigerators all showed gains from the preceding quarter. In addition to benefitting from higher sales Bohn's operations were free from extraordinary charges incurred last year which included heavy writedowns for inventory adjustment and for losses in sales of plants. As a result of this housecleaning the company returned into the black in the first quarter.

Construction Dips from Summer's Record Rate

CONSTRUCTION activity turned downward in October from the record rate it had maintained through the summer. A joint survey by the Bureau of Labor Statistics and the Commerce Department's Construction Division shows total value of construction put in place during the month was $2695 million, 4 per cent less than in September.

Monthly construction totals climbed steadily from February through September, as shown in the accompanying chart. Although the October total represents the first decline since the early part of the year it is still the third best on record.

Only the Beginning—The slight decline in October is only the beginning of a trend, many construction industry observers believe. Estimates of new construction put in place represent for the most part work started during earlier months and reflect only to a limited extent the effects of federal tightening in housing credit. It now appears that housing starts will be hard hit by tighter credit restrictions and accelerate the downtrend in construction in coming months.

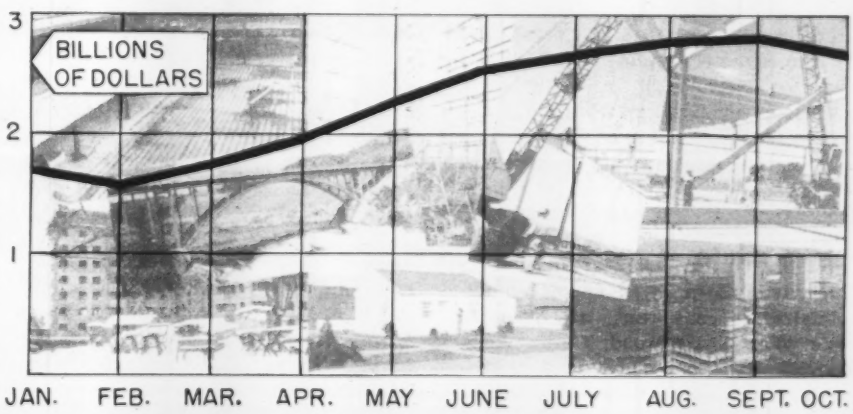
Importance of housing to overall construction is shown in the ten-month total. More than 1.1 million new nonfarm dwellings were started in the first nine months. Expenditures in the first ten months for residential construction reached $10,370 million out of $22,853 million spent for all construction. New dwelling units accounted for $9465 million of the residential total. All private construction totaled $17,050 million in the first ten months. With new dwelling units running 63 per cent ahead of 1949, all construction in the first ten months was carried up to a point 22 per cent higher than in the like period last year. Nonresidential building is up 10 per cent and public construction is up 8 per cent.

Not All Bad — Taking up part of the slack is a spurt in industrial and commercial building. October was the biggest month this year for the two groups combined as the total rose to $246 million from $221 million a month earlier. Industrial building for the year to date totals $812 million and commercial building adds $997 million.

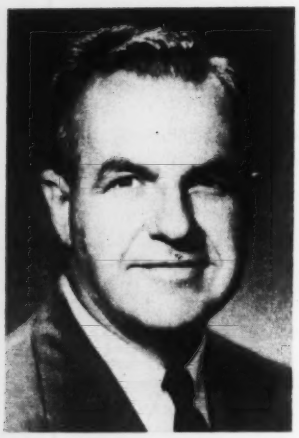
Some slowing may result in commercial building from the NPA order stating that store buildings now started could be stopped before completion should such action become necessary in the future. Industrial building on the other hand is gathering steam.

Building Pace Slowing but Is Still High

. . . Tighter credit hasn't yet taken its toll



Men of Industry



F. R. DAVIS
. . . directs purchases at Continental Steel

F. R. Davis was appointed director of purchases, **Continental Steel Corp.,** Kokomo, Ind. He succeeds **G. L. Rathel,** vice president-purchases, who retires at the end of this year after 37 years of service with the corporation and predecessor companies. **D. J. Pickett,** credit manager, was appointed as assistant to Mr. Davis. They assume their new assignments Nov. 1 in order to take over full responsibilities in January, and Mr. Rathel will assist them with advice and counsel until effective date of his retirement.

Robert G. Van Keuren was appointed chief sales engineer, abrasive division, **Norton Co.,** Worcester, Mass. He succeeds the late **A. Oakleigh Bush.** Since 1945 Mr. Van Keuren served as a section head in the sales engineering department with the title of sales engineer.

Arthur V. Bender was appointed chief engineer, **National Lead Co.,** New York. He joined the company in 1939 as an industrial engineer for the titanium division, Sayreville, N. J., and headed the plant expansion program there in 1944. In 1946 he transferred to the general engineering department in New York, specializing in problems concerning titanium. Mr. Bender became manager, project section of that department, in 1948 and supervisor of the general engineering department last year.

John E. Oliver, secretary-treasurer, Turbodyne Corp., was appointed administrative assistant at **Western Gear Works,** Lynwood, Calif. **J. S. Morgan** was made assistant to the works manager, Lynwood plant.

HUNTER MICHAELS
. . . vice president, American Locomotive

Hunter Michaels was elected vice president, **American Locomotive Co.,** New York. He was director of the company's Railway Steel-Spring Division which has plants at Latrobe, Pa., and Chicago Hts., Ill., and has been active for more than 47 years in the railway supply industry.

Paul E. Warner succeeds **John C. Ruf,** retired, as Philadelphia district sales manager of **Ohio Injector Co.,** Wadsworth, O.

M. B. Garber was appointed director of sales, **Thew Shovel Co.,** Lorain, O. **J. T. Cushing** was named sales manager, in charge of domestic sales except those to the federal government. **Robert Maynard** remains as export manager, and **Q. J. Winsor** relinquishes his duties as assistant general manager and assumes a new position under the general manager with the title of manager of development sales.

William J. Borth, since 1945 a buyer in charge of sheet and strip steel purchases, General Electric Co., was assigned by **Willys-Overland Motors Inc.,** Toledo, O., to assist in procurement of materials vital to the company's civilian and defense production.

Ken Miller was appointed Fort Wayne, Ind., representative for **J. N. Fauver Co. Inc.,** Detroit.

John S. Coey was appointed eastern sales manager, **Hooker Electrochemical Co.,** Niagara Falls, N. Y. **T. H. Trimble,** formerly eastern sales supervisor, was made assistant manager, Niagara sales office.

FRED C. FOY
. . . Koppers V. P. & gen. mgr., tar prod. div.

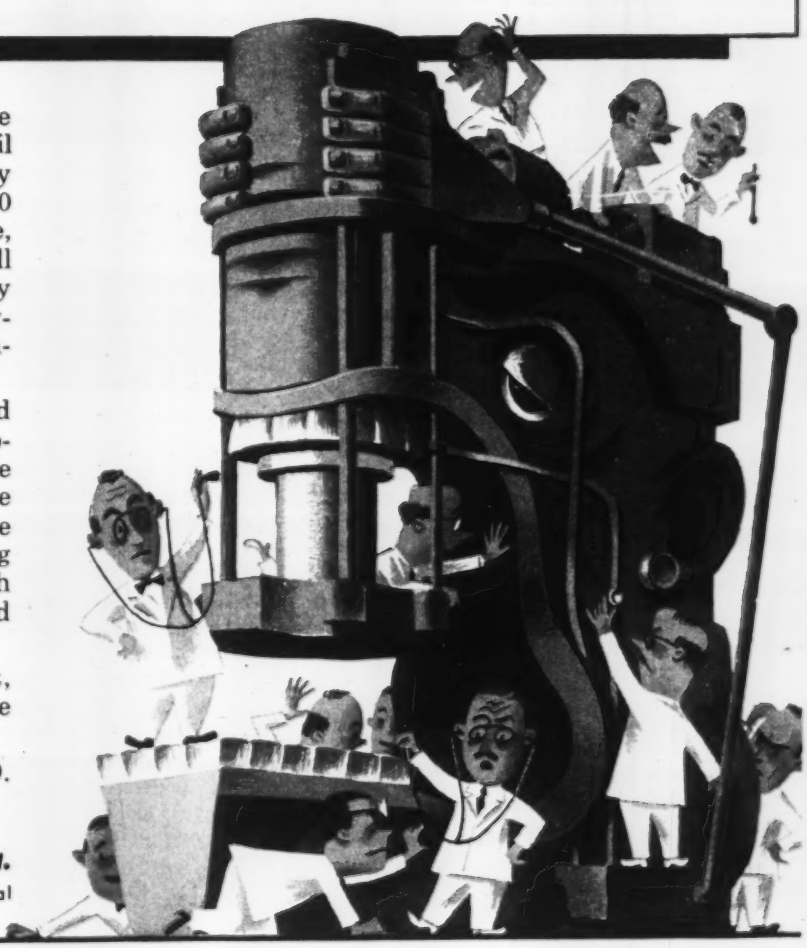
Fred C. Foy, manager, sales department, **Koppers Co. Inc.,** Pittsburgh, was elected a vice president, and on Dec. 1 will assume the position of general manager, tar products division. He succeeds **J. N. Forker,** vice president and general manager of that division since 1946, who retires in December. **Cooke Bausman Jr.,** assistant to Mr. Foy, was appointed acting manager of the sales department, effective immediately. **J. B. Keeler,** manager, traffic and transportation department, was made a vice president.

O. F. Heslar was appointed executive vice president, and **J. G. Martin,** assistant secretary-treasurer of **E. C. Atkins & Co.,** Indianapolis. Mr. Martin also continues as credit manager. **A. L. Martinson** was promoted to merchandise manager and general sales manager, hardware division.

Morse Chain Co., division of Borg-Warner Corp., Chicago, appointed: **J. N. Candler,** vice president and assistant general manager; **R. J. Howison,** vice president in charge of sales; **E. W. Deck,** vice president-manufacturing, Ithaca, N. Y.; **M. V. Durkin,** vice president-manufacturing, Detroit; **W. M. Reynolds,** secretary-treasurer.

H. Gottwald, for the last year assistant sales manager, Nordstrom Valve Division, **Rockwell Mfg. Co.,** Pittsburgh, was appointed assistant vice president, meter and valve division. **W. A. Marsteller** resigned, effective Jan. 1, as vice president of Rockwell Mfg. Co. and as vice president and director of Edward Valves Inc., East Chicago, Ind., to establish the Marsteller Co., consultant in marketing

SUNVIS H.D. 700 OILS PREVENT AND CURE "THROMBOSIS" IN PRODUCTION MACHINERY



Reduced output and extra maintenance cost are the penalties when clogging occurs in the oil circulating system of machinery. But this costly production ill can be avoided. Sunvis H.D. 700 Oils *keep circulating systems clean*. What's more, if trouble exists now, Sunvis H.D. 700 Oils will *free oil lines and bearings of foreign matter*. They go to work immediately loosening up and carrying away any accumulation of dirt, carbon, water, or other contaminants.

Sunvis H.D. 700 Oils are specially developed for modern circulating systems on machines operating where contamination is a troublesome factor. Sunvis H.D. 700 Oils are extremely stable and have long life even under the most adverse conditions. They have inherent rustproofing characteristics, and the high film strength needed to eliminate scoring on heavily loaded antifriction type bearings.

Sunvis H.D. 700 Oils are also fully detergent, dispersive, and resistant to foaming, and are available in all required viscosities.

For further information about Sunvis H.D. 700 Oils, write for booklet S-11.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***

In Canada: Sun Oil Company, Ltd., Toronto and Montreal

SUN PETROLEUM PRODUCTS

"JOB PROVED" IN EVERY INDUSTRY

SUNOCO®

and advertising. The new firm will be located in Chicago after the first of the year.

Alfred L. Gostow was appointed

ALFRED L. GOSTOW
. . . will manage Chrysler's Dodge-forge plant

manager of the forge plant at the Dodge Division of **Chrysler Corp.**, Detroit, succeeding **Grover Eads,** retired. Mr. Gostaw joined Chrysler in 1942 as general superintendent of the forging division in the Dodge Chicago plant. He supervised construction of the forging facilities there and also assisted in the organization of the forging division's personnel. Since 1945 he has been assistant forge plant manager in Detroit for Dodge.

R. P. Clausen, assistant chief engineer, was appointed chief engineer of the radio tube division, **Sylvania Electric Products Inc.,** Emporium, Pa. He succeeds **M. A. Acheson,** transferred to the staff of **E. Finley Carter,** vice president-engineering at New York. **H. C. Tittle,** engineering service manager, was appointed assistant chief engineer, radio and television division.

Harvey E. Mole Jr. was made vice president in charge of investments, **U. S. Steel Corp.** and **Carnegie Pension Fund.** His offices are in New York.

Russell W. McGuire was appointed industrial sales manager, **Trion Inc.,** McKees Rocks, Pa.

Victor E. Schlossberg was appointed assistant chief engineer, Indiana Harbor Works, **Inland Steel Co.,** Chicago. He was superintendent of the electrical, power and steam departments since 1947.

W. E. McCoy was named assistant sales manager, central division, **Caterpillar Tractor Co.,** Peoria, Ill., to succeed **Herman Eberling,** now serving on active duty in the U. S. Corps of Engineers.

James A. Roemer, president, **Niles Rolling Mill Co.,** Niles, O., was named treasurer in addition to his other duties. **Minnie K. Huber,** purchasing agent, was named secretary. These elections follow the recent death of **Allan Davidson,** secretary-treasurer.

Link-Belt Co., Chicago, elected **Bertram V. Jones** advertising manager to succeed the late **Julius S. Holl. John F. Kelly** continues as assistant advertising manager. Mr. Jones for seven years served as advertising manager for Link-Belt Speeder Corp., a subsidiary company building shovel-cranes.

Robert K. Spofford was named director of purchases, **John A. Roebling's**

ROBERT K. SPOFFORD
. . . director of purchases at Roebling's Sons

Sons Co., Trenton, N. J. He was with Okonite Co. as purchasing agent, and previously was assistant to the supervisor of purchases, Continental Can Co. Inc.

Harold R. Ryan was appointed superintendent, Cambell Works open hearth department, **Youngstown Sheet & Tube Co.,** Youngstown. He succeeds **T. A. Cleary** who became general superintendent of the Campbell Works' steel plant and Struthers Works. **T. Bruce Carpenter** succeeds Mr. Ryan as superintendent, open hearth, Brier Hill Works.

Warren D. Sherrow was appointed special sales representative, electrode division, **Great Lakes Carbon Corp.,** Niagara Falls, N. Y.

Buensod-Stacey Inc., New York, appointed **Joseph W. Kreuttner** to its general sales department. He was vice president and general manager Air & Refrigeration Corp.

Louis A. Benek was appointed superintendent, brick mason department, Midland Works, **Crucible Steel Co. of America,** Pittsburgh.

Simmonds Aerocessories Inc., Tarrytown, N. Y., promoted **Howard Holmes** as general manager of development engineering and sales to supervise the aeronautical product development, and **G. J. McCaul** as assistant general sales manager.

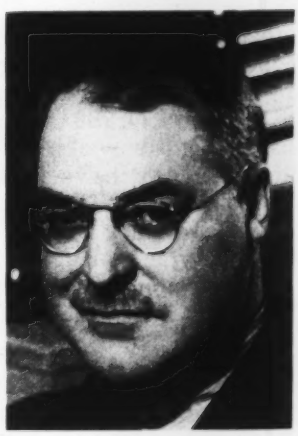
A. M. Byers Co., Pittsburgh, appointed **A. D. Sheere** as manager of its San Francisco division. He succeeds **P. D. Tabler,** retiring. Mr. Sheere was manager, Houston division, and is succeeded there by **N. L. Brown,** field service engineer, St. Louis.

Kenneth R. Geist succeeds **Fred E. Haker,** retired, as director of purchases, **Allis-Chalmers Mfg. Co.,** Milwaukee. Mr. Haker will remain until Jan. 1 as a special representative reporting to the president.

Paul E. Crafton was appointed Chattanooga, Tenn., district sales engineer, **F. J. Evans Engineering Co.,** Birmingham.

Shannon C. Powers was appointed general sales manager, **Russell Electric Co.,** Chicago, a subsidiary of Raytheon Mfg. Co.

J. S. Snelham, vice president and comptroller, **Continental Can Co.,**



J. S. SNELHAM
. . . Continental Can V. P. of finance

New York, was promoted to the newly created position of vice president in charge of finance. **G. J. Barry** was promoted from assistant comptroller and assistant treasurer to comptroller, and **H. A. Swertfeger**

HARRY L. FOX
. . . supt. Farrell blast furnaces, Sharon Steel

C. I. BRADFORD
. . . Rem-Cru Titanium director of operations

A. ALVEN
. . . Lipe-Rollway general sales manager

from assistant to the vice president and comptroller to assistant comptroller.

Sharon Steel Corp., Sharon, Pa., appointed **Harry L. Fox** as superintendent of blast furnaces at the company's Farrell Works, and **Dale E. Bartholomew** was appointed assistant superintendent. Mr. Fox has been with the works for the last 25 years, and until recently was general foreman in the same department.

Raymond P. Brewer was elected vice president, treasurer and a director of **Symington-Gould Corp.,** Depew, N. Y. He has been with the company 17 years and formerly was secretary-treasurer. **James F. Thompson Jr.** was named to succeed Mr. Brewer as secretary.

Robert Parsons was appointed executive vice president, **Century Engineers,** Los Angeles. He was sales engineer, aircraft sales division, Firestone Tire & Rubber Co.

Raymond W. Sundquist was appointed assistant division superintendent, blast furnaces, for **Carnegie-Illinois Steel Corp.'s** Gary Works, a U. S. Steel subsidiary.

John F. Fennelly was elected to the board of directors, **Stewart-Warner Corp.,** Chicago, to fill the vacancy caused by the death of **Charles F. Glore.**

C. I. Bradford was appointed director of operations, **Rem-Cru Titanium Inc.,** Bridgeport, Conn., jointly owned by Remington Arms Co. Inc. and Crucible Steel Co. of America. Mr. Bradford was manager of the development division at Remington in Bridgeport, where for the present Rem-Cru Titanium operations are centered. Headquarters of the company will be established later in the Pittsburgh district. **Edward L. Wemple** was appointed production manager of Rem-Cru, and **Dr. Walter L. Finlay** as research manager.

Utica Drop Forge & Tool Corp., Utica, N. Y., appointed **Thomas R. Hughes** vice president and sales manager. He joined the company in 1940 as a production control man, and for the last year was sales manager.

Robert A. Hoffer was named engineering manager, plastics division, chemical department, **General Electric Co.,** at Pittsfield, Mass. **John T. Castles** was appointed manager of that department's silicone plant at Waterford, N. Y. **Allan L. Davis** was appointed manager of service of the transportation divisions of the apparatus department in Schenectady, N. Y., a newly created position. **Warren D. O'Neal** succeeds **J. Edmund Savage,** retired, as manager, production division, apparatus department, and **C. Kenneth Emery** replaces Mr. O'Neal as manager, technical publications, advertising and sales.

A. Alven was appointed general sales manager, **Lipe-Rollway Corp.,** Syracuse, N. Y. For the last year and a half he was general sales manager, Rollway Bearing Co. Inc., a subsidiary, and continues in that capacity.

Albert H. Clem was appointed to the newly created position of assistant to the vice president in charge of sales, **Pennsylvania Salt Mfg. Co.,** Philadelphia. He was assistant manager-sales, special chemicals department.

Robert J. Reidy was named sales representative, automotive, aviation and government division, **B. F. Goodrich Co.,** in the Milwaukee district. He succeeds **Abert B. Goering,** retired. **H. C. Krimmel,** manager, central Ohio district of the division, has also retired.

National Lead Co., New York, named **Alfred H. Drewes** a director and member of the executive committee.

Frank U. Hayes, sales manager, **Bullard Co.,** Bridgeport, Conn., was elected a director to succeed **E. P. Blanchard,** formerly director of sales, who retired at the end of September after 30 years with the company.

George L. Fenn, secretary and assistant treasurer, **Adamson-United Co.,** subsidiary, United Engineering & Foundry Co., Pittsburgh, was elected to the board of directors of the subsidiary.

OBITUARIES...

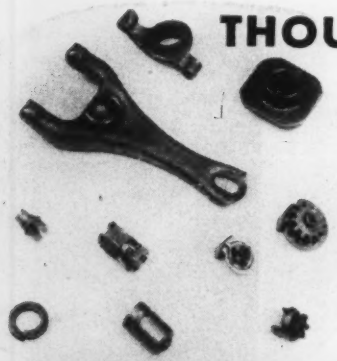
Albert J. Love, 65, president and general manager, **Love Bros. Inc.,** Aurora, Ill., died Oct. 25.

William F. Munday, 54, who since 1949 has been deputy comptroller of **International Nickel Co. of Canada Ltd.,** Copper Cliff, Ont., and its U. S. subsidiary, International Nickel Co., died Nov. 1 after a brief illness.

Arthur C. Green, 68, vice president in charge of sales, **Goodman Mfg Co.,** Chicago, died Oct. 31.

Lance Nicholson, 75, president and treasurer, **Nicholson & Hall Boiler & Welding Corp.,** Buffalo, died Oct. 31.

Gideon Roos, 62, co-owner of **Roos Tool & Mfg. Co.,** Montclair, N. J., died Nov. 2. For 20 years he was tool designer for United Research Co., and established the Roos company 25 years ago.

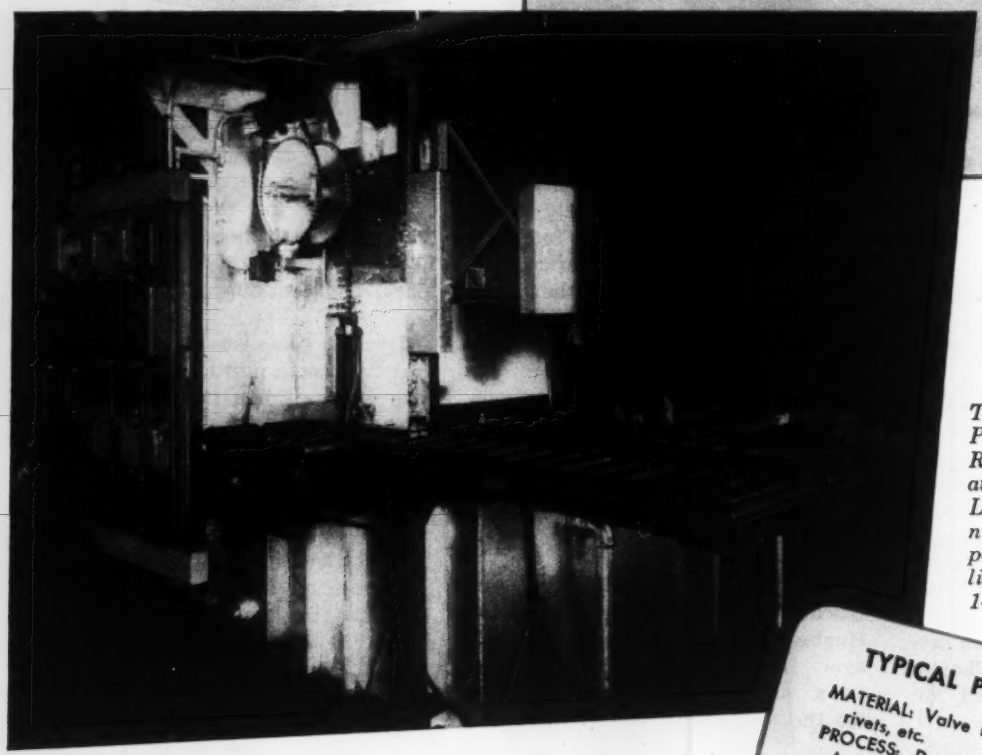


THOUSANDS OF MISCELLANEOUS PARTS

*DRY CYANIDED

IN THIS 'Surface' BATCH-TYPE HIGH-PRODUCTION FURNACE

***'Surface' RX Gas Atmosphere enriched with natural and ammonia gas.**



This 'Surface' Batch-Type, High Production Furnace features Radiant Tube Heating, built-in atmosphere generator (optional), Loading and Unloading mechanism, integrally built tank equipped with lowerator mechanism for liquid quenching. Occupies only 144 square feet of floor space.

24-HOUR PER DAY OPERATION ESTABLISHES RECORD PRODUCTION FOR INDUSTRIAL HEAT TREATING COMPANY, TOLEDO, OHIO

In a commercial heat treating shop the furnace equipment must be flexible to meet the varied demands of batch heat treatment and provide mass production economy. *This 'Surface' Batch-Type High Production Furnace installation meets all these requirements for Dry (Gas) Cyaniding, Gas Carburizing, Carbon Restoration (Skin Recovery), Homogeneous Carburization, Clean Hardening and for General Heat Treating.*

This 'Surface' furnace requires a minimum investment for each pound of capacity. Light case dry (gas) cyaniding can be done for less than one-half cent per pound of work, exclusive of burden and fixed charges. Investigate its cost reducing possibilities for your plant—too!

TYPICAL PERFORMANCE DATA:

MATERIAL: Valve lifters; pinion gears; stampings; rivets, etc.
PROCESS: Dry Cyaniding, Case depth 0.002" to 0.020".
HARDNESS: File hard.
CYCLE: Loaded trays moved into vestibule. Trays move readily in and out of furnace on roller hearth. Lowerator mechanism provides convenient oil quenching from atmosphere-purged vestibule.
TOTAL TIME: 1 hr. to 2 hrs.—12 min. varying with parts and case depth required.
NET LOADS: Up to 800 lbs. for these parts.

WRITE FOR BULLETIN SC-145
"Dry Gas Cyaniding in 'Surface' Continuous and Batch-Type Furnaces"
No obligation

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

FOREIGN AFFILIATES: Stein & Roubaix, Paris — British Furnaces, Ltd., Chesterfield

'Surface' INDUSTRIAL FURNACES

FOR: Gas Carburizing and Carbon Restoration (Skin Recovery), Homogeneous Carburization, Clean and Bright Atmosphere Hardening, Bright Gas-Normalizing and Annealing, Dry (Gas) Cyaniding, Bright Super-Fast Gas Quenching, Atmosphere Malleableizing and Atmosphere Forging. Gas Atmosphere Generators.

Production AND Engineering NEWS AT A GLANCE

PLANER, SHAPER LIMITATIONS OUT—Science of hydraulics plus a "pinch" of machine tool ingenuity is upsetting preconceived ideas on traditional limitations of shaper and planer operations (p. 94). H. B. Newton, Rockford Machine Tool Co.'s president, says the application of hydraulic tracer controlled tooling to these machines removes lengthwise limitations on shapes produced. The control mechanism, he points out, makes possible three-dimensional machining in the complete sense of the word. Setups possible are solid tooling achievements capable of accurate and rapid repetitive production operations as well as die work and various other tool room procedures.

"MASTERS" OF METALLURGY—Program of evening study which will earn graduate engineers master's degrees in metallurgy within five or seven college terms is announced by Rensselaer Polytechnic Institute, Troy, N. Y. The longer period includes two terms of preparatory work by engineers who are not bachelors in metallurgy. The program, requiring two or three hours of work on two nights of each week was approved by industrial executives and engineering associations. Already more than 40 engineers are enrolled at the institute for the first term's work.

TRIPLE FUNCTION—Leaded lubricants do more than "grease the skids" (p. 98). When used in gears and bearings that are exposed they not only provide friction-free operation, but also protect bearing surfaces. The comparatively soft film of lead is capable of absorbing dirt, grit and abrasive materials. In some uses, the lead metallizes scored or pitted rods or other machine components. They also have an increased load carrying ability, and are highly beneficial in improving resistance to corrosion when water is present.

U. S. LEADING TITANIUM ORE PRODUCER—Titanium, now about to become an important metal in its own right, has been known for 159 years and used by the steel industry for 50 years as an alloying material. The element is the ninth most abundant in the earth's crust. Its principal ores are ilmenite and rutile, although several others are mined commercially. Until recently, India was the largest producer of titanium ores, but during the war United States took the lead. Today the world's largest titanium mine is in the Adirondack mountains of New York. Metallurgical useful ores generally contain 24 to 36 per cent of the element.

MINING INDUSTRY EYES STAINLESS BELTS—Possibility of increased belt life is spurring mining industry investigations of stainless steel belts for conveying operations (p. 100). First costs seem to be lower than other materials, but big problem is feasibility. One of the principal problems solved was the camber found in most coils of continuous rolled steel. In many instances, it was found that the camber in the as-rolled condition was too great for belt use. Several methods now exist for removing the camber, one of which is a machining operation on the entire coil.

ANSWER TO MAINTENANCE MAN'S PRAYER—Installing unit heaters or taking them down for overhaul is no longer a two-man job. Reznor Mfg. Co., Mercer, Pa., reports development of a lift assembly that cuts installation costs by as much as 50 per cent, and saves up to 50 per cent of the time normally required to install heaters. The company says the assembly enables one man to install a heater conveniently; larger heaters can be installed by two men in a hurry. The lifting unit brings heaters within 7 inches of the ceiling and can be used for any type installation.

HOW MUCH ERROR?—One way to step up production in a plant is to set up sensible tolerance standards, in other words—keep tolerances workable (p. 102). But job is not easy. If you ask ten designers how much permissible error to allow to maintain economical shop procedure, chances are you will get 100 different answers. One thing is sure. It is uneconomical and wasteful to maintain a rigid attitude in controlling accuracies within close tolerances on unimportant and nonfitting workpieces. The situation is just the opposite when producing important parts. A big help would be the adoption of a system of markings which could easily be followed by shopmen, eliminating conflicting systems of indicating accuracies.

CLOSE CONTROL DOES IT—Close heat treating control is the reason why Utica Forge & Tool Corp., Utica, N. Y., is successful in producing precision jet engine parts at a fast production rate. Process used in forming the jet turbine and compressor blades from bar stock involves two upset and four forging operations with the material heated to proper temperature prior to each operation. Forge shop itself looks more like the control room of a power company. About 21 circular and 18 strip chart Electronik potentiometer controllers are employed to maintain accurate forging temperatures in the 24 furnaces used. This close check on temperatures makes possible a rigid schedule of pressing and hammering. A wrong heating temperature, for instance, would mean additional hammer blows, and additional hammer blows cause objectionable changes in the metallurgical properties of the jet parts.

News Summary—p. 63 *Market Summary—p. 139*

"Curvilineal" Machining Now in Bailiwick

Traditional limitations of these useful machines to "straight line" generation of surfaces are removed by ingenuity of machine tool designers versed in science of hydraulics

By GUY HUBBARD
Machine Tool Editor, STEEL

PLANERS AND SHAPERS generally are thought of as "straight-line" machines—machines that are confined to machining of shapes by the projection of straight lines. In other words, curves, steps, etc., can be made on the end projection of the work—but not longitudinally.

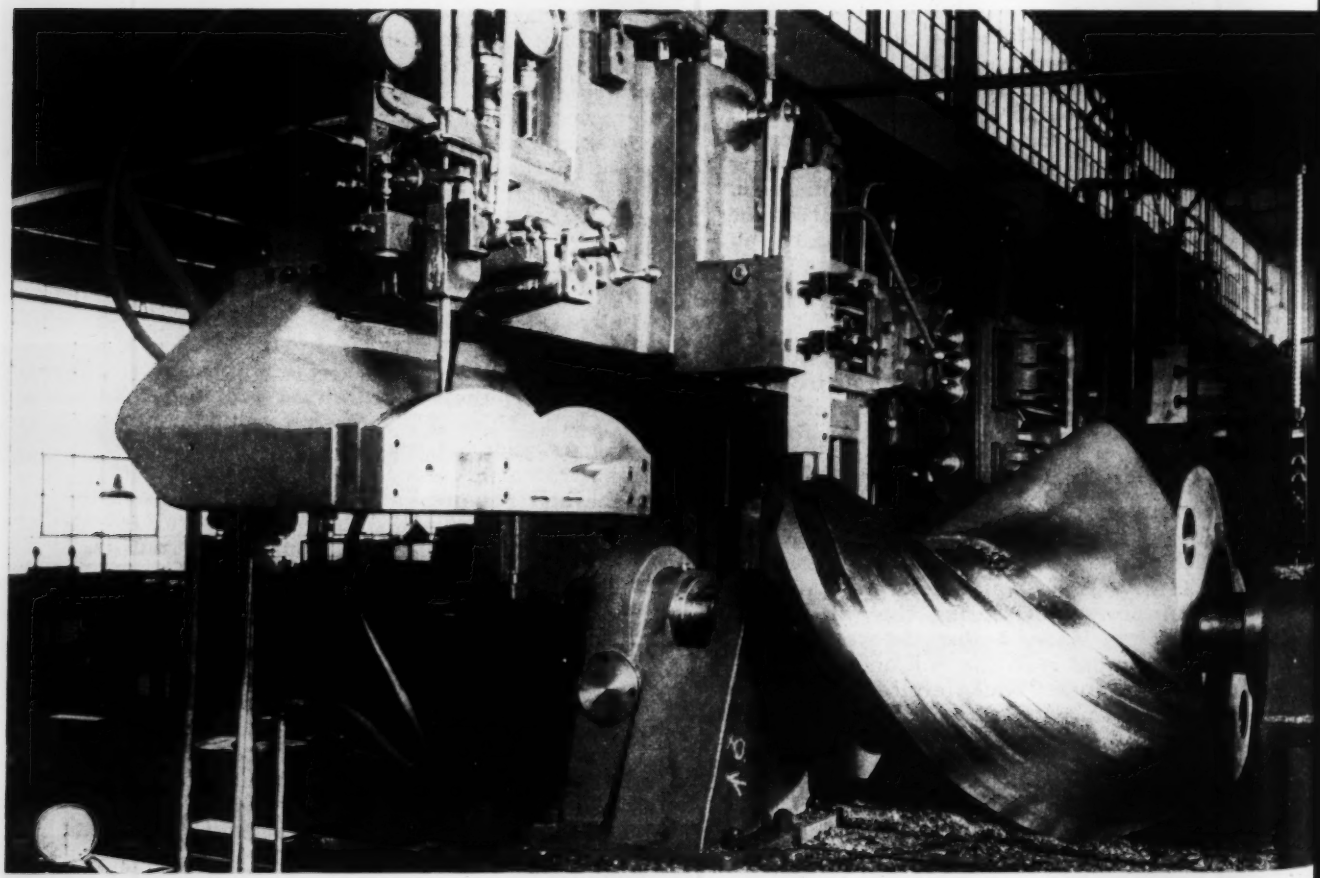
Now, tracer-controlled planing, which includes novel techniques as practiced by Rockford Machine Tool Co., Rockford, Ill., is upsetting preconceived ideas on traditional limitations of shaper and planer operations.

Thanks to the application of hydraulic tracer controlled tooling of planers and shapers, lengthwise limitations on shapes are removed. H. B. Newton, Rockford's president, says these machines with tracer control mechanism, become automatically "variational" lengthwise as well as crosswise—thus making possible three-dimensional machining in the complete sense of the word.

At the plant, K. M. Allen, sales manager, and Miss A. M. Sanner, advertising manager, went to great lengths to demonstrate some of the interesting practical examples of tracer controlled machining on their hydraulic planers and shaper-planers. The setups were in no way trick setups. They proved to be solid tooling achievements capable of accurate and rapid repetitive production operations as well as die work and various other tool room procedures.

Works on Several Machines—The hydraulic tracer mechanism used on the machines illustrated herewith was designed for application to any of the company's openside shapers, planers or shaper-planers. It consists of a special head which is mounted on the machine either as a rail head or side head, a dupli-

Fig. 1—Setup in hydraulic shaper-planer for combined helical generation and contouring of two-lobe blower rotor for diesel engines, showing master form and stylus in foreground



ick of Planers, Shapers

cator valve apparatus and a hydraulic pumping unit which is an entirely separate entity from the hydraulic feed and the control system of the machine itself.

The rugged head saddle is mounted and is subject to feed and traverse controls same as standard saddle. It is counterbalanced through full length of stroke. This stroke is accomplished by means of a piston rod attached to the slide and working in a hydraulic cylinder mounted on the saddle. Dovetail ways are machined on the head slide to carry the tool slide—these being provided with gibs and screw adjustment. There is a duplicator slide, also gibbed and screw adjusted. Each is provided with micrometer dial arrangements for exact setting.

Tool Block Sets Tool—The tool slide carries a tool block which has provision for setting the tool in correct relation to the tracer sidewise as well as in line. The duplicator slide, which is adjustable in the same plane as the tool slide, is provided with a dovetail on which is mounted the duplicator valve slide. This is adjustable in a transverse plane to position the tracer in correct relation to centerline of tool.

The hydraulic duplicator valve—a patented feature—is described by its inventors as "a self-contained director of the reproduction functioning of the mechanism." Path set by the master form—which may be of wood, plaster or other easily worked material, as well as metal—is imparted to a tracing stylus at one end and directly to the valve at the other end. This eliminates any secondary action which might result in time-lag and consequent inaccuracy in transmittal of shape from pattern to workpiece.

Oil Directed Under Pressure—What the valve does is to direct flow of oil under pressure to one end or the other of the operating cylinder in response to changes in position of the stylus on the master. Being constantly under pressure on both sides, the piston always is held rigidly in all positions and so keeps the tool firm in cutting position. At the same time the hydraulic balance of the valve is such that very light pressure at the stylus end serves to actuate the mechanism. During the demonstration, the stylus was allowed to pass over my hand. The pressure caused no discomfort.

Precision and "Snap"—Another function of the valve is automatic retraction of stylus from master and tool from workpiece, at end of each cutting

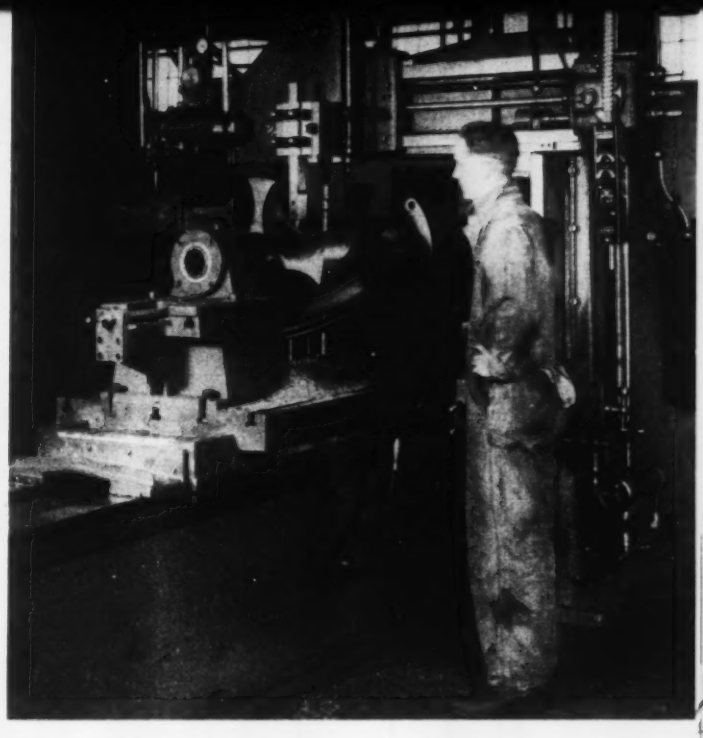


Fig. 2—Helical generating and hydraulic contouring of three-lobe blower rotor which runs with two-lobe rotor shown in Fig. 1, therefore requiring exact mating

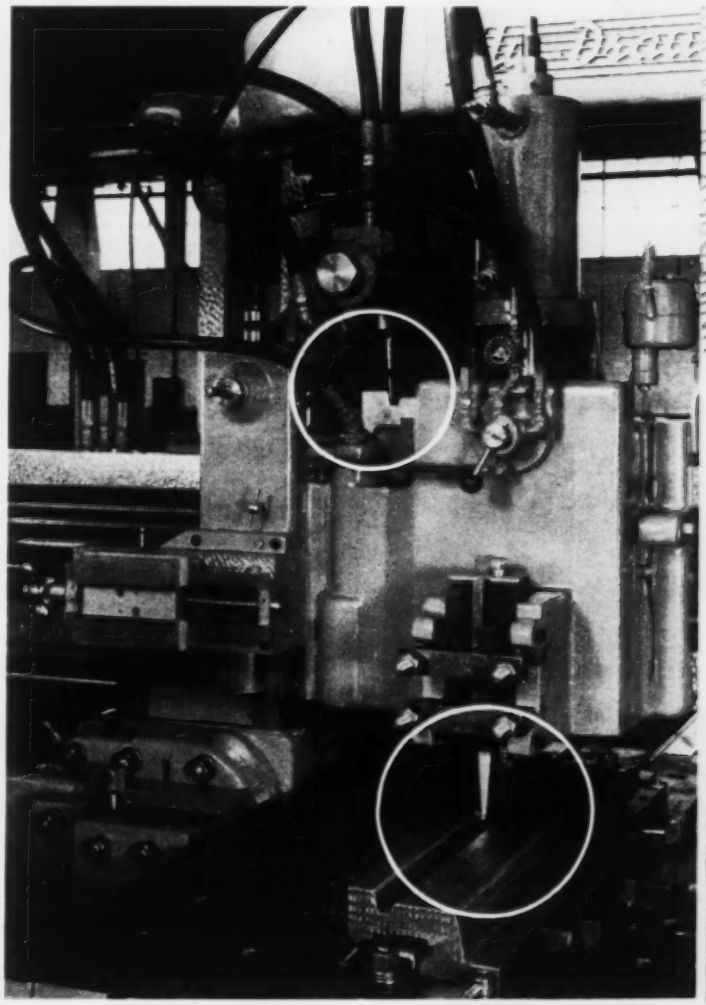


Fig. 3—Straight line contouring controlled by stationary template on crossrail. High production and exact repetition of size and shape are insured by this simple setup

stroke—followed by their return to operating position at beginning of each cutting stroke. This cycle takes place regardless of length or position of stroke. Amount of rise and speed of return to working position both are readily regulated. During demonstrations I was impressed by the "snap" and precision with which this cycle was carried out—there being no need to "cut any air" to accomplish it.

Its object, of course is to allow maximum return speeds without subjecting the master to undue wear and tear, and as a "tool lifter" to do the same for the tool. Automatic locking of the mechanism in retracted position is provided for in case of power shut-off or failure. This forestalls drop of the vertical head which might damage the master, machine and the work.

Tracer Independently Powered—It should be mentioned here that power for the tracer mechanism comes from an independent floor-mounted "package" containing motor, pumps, valves, oil reservoir and water system for cooling the hydraulic oil.

When pointer type tracer is employed, angle of following rise is 40 degrees to the horizontal in full form duplication. Ratio of maximum rise in degrees, to maximum speed in feet per minute, generally speaking is the same. However, at less than maximum rise speed can be stepped up. By the same token, accurate performance can be attained with angle of rise closely approaching 45 degrees, when cutting speed is slowed down. This of course is limited by considerations of size of the cut and length of tool life.

Ordinarily in contour duplicating operations, angle of rise is not more than 5 or 6 degrees to the vertical. Instead of accomplishing this by "following"

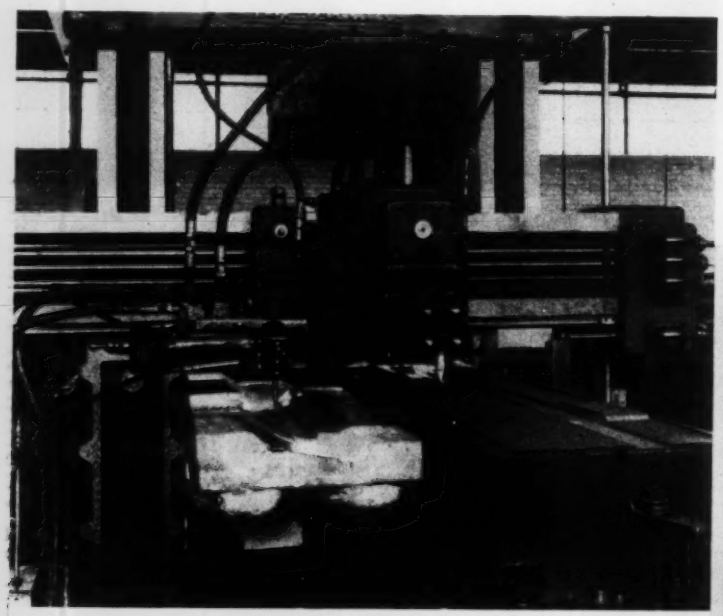
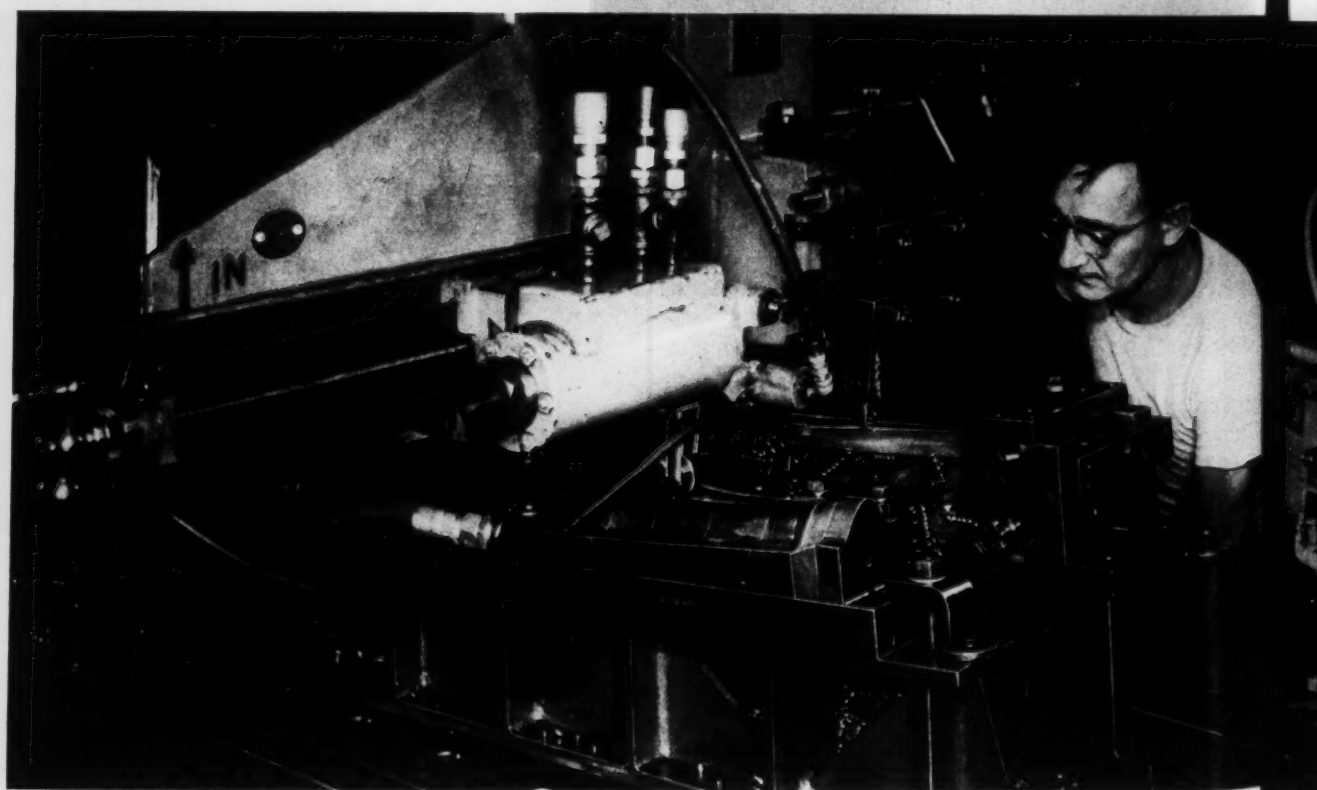


Fig. 4 (left)—Large die job involving irregular curves both longitudinally and laterally, is handled by hydraulic tracer operating on master former which travels with platen

Fig. 5 (below)—Production machining of turbine blades is carried on in openside shaper under control of "laminated" master actuating roller tracer. Work is held in magnetic chuck

Fig. 6 (right)—Small double curved parts are reproduced rapidly and accurately by standard hydraulic tracer unit mounted on cross rail of 36-inch openside hydraulic shaper



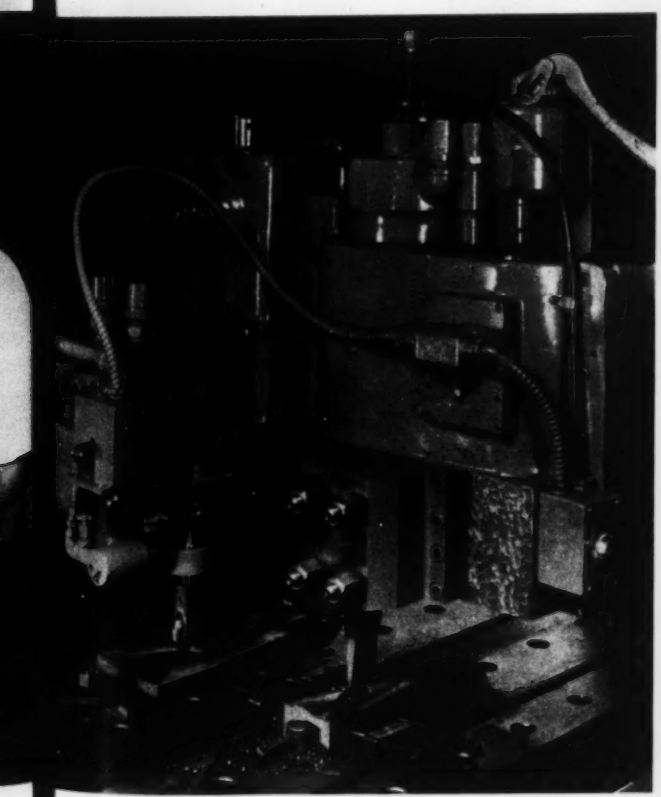
it is done by positioning the tracer on the master form during the feeding part of the cycle when tracer and tool respectively are lifted off the master and the work.

Proof of the Pudding—And now for "proof of the pudding" in the form of practical examples of this new technique in the art of cutting metals. Figs. 1 and 2 give intimate details of a setup on blower rotors for diesel engines—Fig. 1 showing a two-lobe male unit and Fig. 2 the mating three-space female unit, the machining of which is very similar to the other.

These hard cast bronze parts must be generated to steep helix angles, they must be smooth and they must be accurate so as to run together with minimum clearance. The work is done in a 32 x 36 x 90-inch Rockford hydraulic shaper-planer, equipped with a rack and pinion type helix generating fixture which revolves the work in predetermined relation to the cutting stroke.

The close-up view, Fig. 1, shows the master former which determines the contour of the lobes on the male unit, with pointed stylus resting on one section of the master. Upon completion of this section to a point where point of stylus overlaps on the other section, workpiece is indexed and stylus is moved to the other section of the master. This takes care of machining one side of one lobe, together with root and part of one side of the next lobe. One more indexing takes care of finishing half of the entire two-lobe rotor—the procedure being repeated to finish the entire rotor.

One More Movement—Machining of the three-lobe rotor, Fig. 2, follows a similar pattern, except that an additional indexing is involved. In this photograph the tool can be seen in action and the relation between tool and tracer is apparent. Bear in mind that in both these setups the shape generated on the work is a combined result of trace control of tool and simultaneous rolling over of the workpiece in the rack-and-pinion operated fixture. This combination of controls holds many possibilities on a wide variety of peculiarly shaped parts.



A considerably more simple setup, involving a stationary template mounted on the cross rail of the machine, is depicted by Fig. 3—former and tool being emphasized by the white circles on the illustration.

In this case the work has the same cross section throughout the entire length. This kind of work can of course be accomplished in an ordinary planer or shaper by constant manual resetting of the tool. That is a slow process, however, and is subject to errors. The master control method cuts the time way down and also insures exact repetitive duplication of the parts.

Traveling Template Moves Work—Another and not-so-simple job is illustrated by Fig. 4, this one being a typical example of what can be done on large die work with the help of the hydraulic duplicator on a planer. In this case the work form changes constantly along the line of machining, this fact being accomplished by means of a traveling template (left) which moves with the work (right) on the planer table.

Application of the system to production work in connection with a 36-inch openside hydraulic shaper, is illustrated by Fig. 5. Workpieces are turbine blades of hard material. These blades—in background in the photograph—are held for machining in a special magnetic chuck. Note that in this case a roller tracer (foreground) is used, this being possible because of the relative flatness of the shape involved.

The sectional design of the master form is a common expedient in work of this kind. It permits of "station dimensioning" and simple blending of the resulting shapes into the overall form. Bear in mind that these masters are sort of "hand made" jobs on which cost must be kept down through ingenious expedients such as this.

Answer To "Irregular" Machining—The final example, Fig. 6, is a typical case involving a standard type of duplicator mounted on a 36-inch openside hydraulic shaper, which is a flexible machine ideally suited to this kind of "irregular" machining. It is a simple matter to remove this tracer unit from the cross rail and to substitute for it the standard head used for conventional shaper work.

The work in this case is a good example of the "queer shaped pieces" which more and more are being encountered not only in die work but also in regular production runs. These can be accounted for by increasing use of turbine and jet propulsion and by other advanced designs involving irregular mathematical curves. Adaptation of tracer control to planers and shapers therefore comes at the psychological moment to solve these difficult machining problems.

SPECIAL LEADED

From submarine periscopes and guns to industrial open gears and bearings, grease containing finely powdered metallic lead plays a vital role in combating friction, water, dirt and pressure

By KEMPTON H. ROLL
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New York

OIL SLICK floating on the surface of the sea could be a fatal giveaway to a submarine hiding beneath the surface. In the early years of World War II this was a serious problem to the allied submarine services.

Propeller shafts, periscopes, disappearing gun mounts all had to be lubricated to assure proper functioning. But the problem was to find a lubricant that would, if it became detached, sink to the bottom instead of floating to the surface and forming an oil slick.

A formula was finally developed in which a calcium base grease was loaded with finely dispersed powdered metallic lead. The lead added in this form gave the results desired: Specific gravity of the lubricant was greater than that of sea water and could no longer form a tell-tale oil slick on the surface. Furthermore the lubricating characteristics and water and corrosion-resistance were enhanced by the presence of the lead.

Lead vs Dirt, Water, Pressure—In industrial applications, the grease acts as a vehicle to carry particles of lead powder to the gear or wearing surfaces where, under pressure, the powder coalesces and forms a uniform layer or film of metallic lead. This tenacious lead lining or covering fills score marks in pitted bearings surfaces and thus, in effect, renews them. Once this takes place, the lead coating itself becomes the bearing surface. Since lead has excellent antifriction properties, the outgrowth of this condition is continued friction-free operation.

Lubricants containing metallic lead are usually employed in applications where gears and bearings are open or exposed to dirt, grit and abrasive materials. The comparatively soft film of lead is capable of absorbing such materials without injuring the bearing surface.

A special compound containing well over 50 per cent finely powdered metallic lead finds successful application in heavy industry. It is used as a lubricant for valve and pump packings exposed to water, steam, gasoline, oil or a wide range of chemicals where the use of lead is permissible. Essentially, the compound is a nonsettling suspension of powdered lead in a completely insoluble carrier. The metallic lead performing somewhat like calcium base greases containing metallic lead, metallizes scored or pitted rods or other machinery with which it is used.

"Triple-Threat" to Friction—Several lead greases on the market contain the triple combination of metallic lead powder, lead oxides and lead soaps. Such combinations result in lubricants which materially reduce friction and consequently lower the operating temperature. They have an increased load carrying ability in addition to preventing wear and corrosion. Lead soaps in a lubricant enhance the load carrying capacity of extreme pressure agents and in addition are highly beneficial in improving resistance to corrosion when water is present.

What's in Grease?—Greases contain four fundamental ingredients: Fat or fatty materials, a base or alkali which is added to bring about saponification of the fat, an oily material, usually petroleum, and additives and other materials which impart special characteristics. Fats may be saponified by many materials, among these being hydroxides of sodium, calcium, aluminum and lithium. However, to obtain special characteristics, soaps of lead, barium, strontium and magnesium are used either alone or in combination with the aformentioned soaps.

Lead soaps do not change in viscosity during storage and do not separate or hydrolyze in the presence of moisture. The latter characteristic is especially important because nonlead greases made with water soluble soaps can absorb considerable quantities of water which cause precipitation of the saponifying compound and, in effect, destroy the lubricating properties.

Many EP Applications in Steel Mills—While leaded

LUBRICANTS MEET SEVERE SERVICE DEMANDS

lubricants were developed primarily for reduction gear sets and similar equipment in steel mill service, field experience has brought out other uses in steel as well as allied industries where both heavy and shock loading is a problem.

They are used in table roll line shaft drives where it is necessary to maintain a protective film in the presence of excess water. They are used in the coiler drives, edger roll drives, slab shear drives, table manipulator gears, screw downs, cooling bed gears, working gear winders and other applications where extreme tooth pressures prevail for short periods of time.

Some typical applications include a 2500 hp reduction gear for a roughing stand, 3000 hp helical reduction gear set, 2500 to 3500 hp reduction gear on a scale breaker, 3000 hp gears and bearings on a hot mill drive, 1200 rpm planetary gear used on a coiler and 3000 hp helical reduction gear set on a finishing stand with a pinion speed of 275-550 rpm.

Water repellence and guarantee against emulsion combine to assure proper lubrication of gear teeth in the systems where water continually is present. Ingenious methods are used to carry a few inches of lubricant floating on top of water and in contact with gear teeth. A siphon automatically drains off surplus water which enters the reservoir. Several years of satisfactory results have been attained with this method where seals cannot prevent water from entering.

"Hydraulic" Means Oil—In modern hydraulically-operated machinery mineral oils have, for the most part, replaced water as the hydraulic fluid. Hydraulic mineral oils are usually high grade highly refined products of low viscosity, reasonably low pour points, chemically treated and inhibited to retard corrosion, foaming and emulsion. Manufacturers of hydraulic equipment usually offer recommendations for oil and generally specify degrees Fahrenheit pour points or a variance of 5 or 10 degrees above or below the viscosities of 100 to 1000 seconds Universal Saybolt at 100° F.

Common oils do not ordinarily come up to the stringent requirements demanded for hydraulic service. To meet these requirements considerable research effort was expended which resulted in the development of special leaded compounds. These exhibit a minimum of 25,000 psi film strength on Timken testing machine, minus 25° F pour point, antifoaming qualities; water repellence and resistance of sludging. Such hydraulic oils depend chiefly on the high film strength and extreme pressure lubricating characteristics of lead soaps and stabilizers.

ACKNOWLEDGEMENT

The author is indebted to Texas Co., New York; Brooks Oil Co., Pittsburgh; Alox Corp., Niagara Falls, N. Y.; Knapp Mills Inc., New York; and to the U. S. Navy for much of the information used in this article.

PHYSICAL PROPERTIES AND CHARACTERISTICS

Commercial grades of leaded lubricants which may be compounded to produce lubricants anywhere within the following property ranges:

Gravity (API)	2.3 to 15.2
Flash, open cup	425 to 575° F
Fire point	480 to 660° F
Pour point	−15 to +50° F
Viscosity, Saybolt Universal	
100° F	325 to 73,000 seconds
210° F	53.8 to 950 seconds
Viscosity index	97 to 80
Timken Test Value, O.K.	35 to 45 pounds

Formulations having the higher lead contents (low viscosity and pour point) are specified chiefly for high speed, high pressure applications. Low viscosity and high pour point are generally used for heaviest mill pinions and reduction gear sets.

Characteristics of leaded lubricants:

(1) *Resistance to thickening*—excellent oxidation stability.

(2) *Load carrying capacity*—carry a minimum 30 pounds lever load on Timken extreme pressure test machine without scoring and do not lose extreme pressure qualities in service. Contrasting with this are ordinary greases which can furnish only up to 10 to 15 pounds lever load. Actually EP type leaded lubricants can be made using lead and sulphur which greatly exceed (up to two-fold) the usual Timken test specifications.

(3) *Resistance to centrifuging*—can be centrifuged without loss of the lead soap compound.

(4) *Adhesive properties*—adheres to gears even if immersed in water.

(5) *No separation*—does not separate in storage or in use.

(6) *Not corrosive*—does not corrode steel, copper, bronze or other bearing metals and in many applications is used to inhibit corrosion.

(7) *Resistance to heat*—can be used without undue thickening at temperatures which may intermittently reach as high as 300° F. Under operating conditions low viscosity lead lubricants can operate and perform successfully from 120 to 150° F while leaded greases may be used up to 500° F.

(8) *Miscibility*—can be cut back with lighter grades if lower viscosity is desired for low temperature service. Mixing should be done around 150° F and outside the lubricating system, if possible.

Manufacturers of the lubricants should be consulted as to the combination of properties best suited for various service conditions.

Are Stainless Conveyor Belts Commercially Feasible?

Possibility of increased belt life attracts mining industry's attention. Other advantages such as first cost, weight and strength under investigation

STAINLESS steel conveyor belts are getting attention from the mining industry. Reason for the interest: Possibility of increasing belt life.

Other possible advantages are a lower first cost of approximately $2.50 per foot. Steel belts weigh one fifth that of rubber belts, have a higher modulus of elasticity. This would further reduce first cost by simplifying installation, reduce the number of parts required and since the horsepower requirements for a belt drive are largely based upon starting load, smaller drive motors might be used.

A. B. Crichton Jr. of Johnstown Coal & Coke Co., Johnstown, Pa. initiated the current interest in stainless belts. In addition, the Mining Development Committee of Bituminous Coal Research Inc., Huntington, W. Va., has devoted much of its time recently to the development of steel conveyor belts. The committee was organized to develop new methods and machines for mining bituminous coal.

30-Inch Belt Runs Successfully—In Allegheny Ludlum Steel Corp.'s development work with Joy Mfg. Co., a 30-inch wide belt has been successfully run on conventional rubber equipment, i.e., crowned pulleys, etc. The belt tracked well, the only difficulty being caused by the reverse bending necessitated by the belt coming from the crowned roll and going into a troughing shape. Forty-five and ninety-degree joints in this belt were made by riveting.

Allegheny also has made several 24-inch wide belts for use at the Creighton, Pa., plant of Pittsburgh Plate Glass Co. for handling dry material fed into glass melting tanks. The joint of the belt now in use is riveted, 90 degrees to the edge of the belt. This belt runs at speeds over 250 feet per minute, 40 minutes every hour, 24 hours a day, 7 days a week, and has been in service for 11 months. It has needed no maintenance during this period. Flat pulleys are employed.

Pulley diameter determines thickness of the belt. Stress induced in the belt as it is bent over the pulley

Operating at 250 feet per minute, this 30-inch experimental stainless steel belt carries run-of-mine coal up a 28 per cent slope. Coal moves smoothly without any tendency to throw back

can be easily determined by using the formula:

$$\frac{t}{D} \times E = S$$ where E = Modulus of elasticity of 29,000,000 psi

t = belt thickness
D = pulley diameter
S = stress produced

To this must be added the stress produced by the load on the belt, which is actually small with regard to the bending stresses. The steel produced to date has been designed so that the proportional limit will be at least twice the bending stress.

Status Quo Maintained—While much of the existing belt drive systems, stands, supports, can be used and greatly simplified, a number of details have to be changed when using steel belts. For example, an entirely new type of splice had to be evolved. This was done by the Mining Development Committee. While the splice developed to date leaves much to be desired, its installation is comparable to that of conventional rubber belt splices.

Steel belts are more difficult to track and keep in alignment than are rubber belts. However, steel belts can be guided better with side rollers. Side rolling the edge of the belt would be beneficial to the belt.

Carnegie-Illinois Steel Corp. has a new type pulley utilizing "self-centering" rolls (STEEL, Sept. 25, p. 83) for use in the production of continuous sheet. One of the many purposes of this new type pulley is to maintain the sheet or strip in perfect alignment as it enters and leaves the rolling mill. The solution of this problem has made possible the solution to the problem of tracking the steel belt.

Defies Gravity—It was always presumed that steel belts would not convey material up an incline as well as would a rubber belt. To determine the degree of difference, an experimental installation was made at Stewart Coal & Coke Co. operation at Whitney, Pa. This is a 90-foot center-to-center belt, 30 inches wide, operating on a slope of 16 degrees, 4 minutes or 28.8 per cent, carrying run-of-mine coal. It normally operates at 250 feet per minute, which is about one-half the conventional operating speed for conveyor belts. Steel belts have operated continuously at rates as high as 400 feet per minute.

The Stewart installation functioned satisfactorily. Deflection between the idlers of the steel belts is practically zero. The coal moves up smoothly without any tendency to throw back, whether the belt is fully or partially laden.

Are They Commercially Successful?—It is too early to say that steel belts are commercially successful. Most of the principal problems pertaining to steel belts have been solved. One of these was the camber found in most coils of continuous rolled steel. This camber in the "as rolled" condition may in many instances be too great for general usage. Several methods exist for removing the camber, one of which is a machining operation on the entire coil.

A new coiled spring type idler roll has been developed for use with steel conveyor belts. When belt is under load, the coiled spring will deflect to give 100 per cent support to the face of the belt.

Metal Cabinets Formed in One Piece

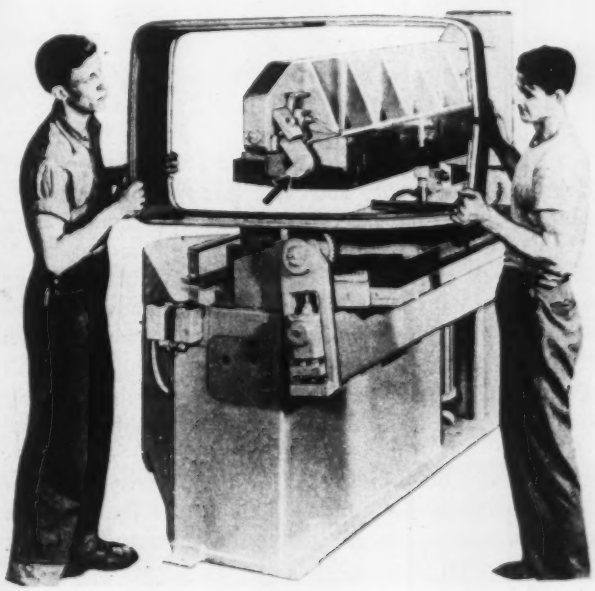
METAL cabinets, in a variety of sizes and shapes, are completely formed in one piece, in a single cycle of operations on a new machine made by Cyril Bath Co., Cleveland. Television set housings, refrigerator cases, liners and evaporator shells and cases for electric ranges, space heaters and other small appliances are some of the items being produced on the machine.

Known as an open-throat, single wing tangent bender, the unit produces cabinets with either flat or crowned sides. Because die changes are comparatively simple and inexpensive, it is readily adapted to making bends of different radii.

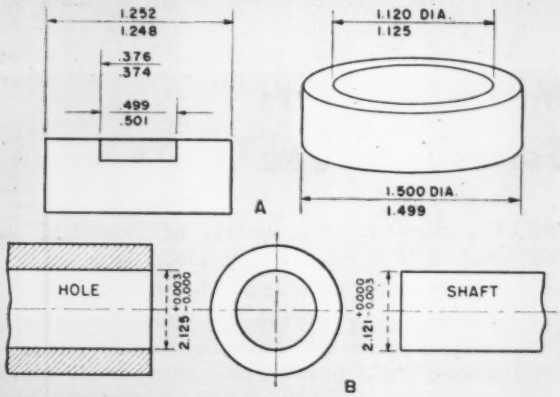
Positioning Now Easier—Another advantage is the ease with which finished cabinets can be unloaded. A unique latching arrangement leaves the ram open at one end after the stroke, providing more than ample clearance space for intermediate positioning of the work and for final removal of the finished case. On previous models it was necessary to disconnect and swing the hold-down arm to one side, to remove the work.

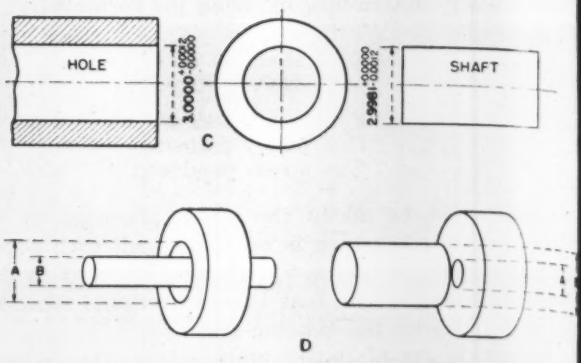
Ram of the machine descends rapidly to within 1 inch of the bottom on its full stroke. At this point, latches at both ends of the ram engage levered arms on the bed and pull the ram down, exerting a pressure of over 17 tons.

Flat metal sheets can be blanked, punched or otherwise formed during this initial movement, and then held steady for the bending wing to move up and form the corner radius, with wrinkle-free flanges.



Removing finished case from the new single-wing tangent bender. In action ram descends rapidly to within 1 inch of the bottom of its full stroke. Then latches (one of which is indicated by arrow) at both ends of the ram engage levered arms on the bed and pull the ram down with a pressure of over 17 tons





To Step Up Production...

KEEP TOLERANCES W

Huge demand for accurate, interchangeable machined parts points up the increasing need for "sensible" tolerance standards. Properly functioning techniques for maintaining dimensions can result in better tooling and tool control, less production and inspection time

HOW LIBERAL should tolerances be on machined components to insure proper functioning and to maintain, at the same time, the most economical shop procedures? Ask ten designers that question and you'll get 100 answers, all of them prefaced with, "It all depends. . . ."

No workpiece ever produced is exactly like any other similar workpiece. For instance, a 2-inch spindle, or a 2-inch hole, measured even with the most sensitive instruments will not be exactly like any other 2-inch spindle or hole.

Even if the work is done with the most accurate equipment, and the errors may be only a few hundred thousandths of an inch, this minus or plus difference below or above the size of the next piece is there just the same. The error, however, is now so small that when any two such parts are fitted into a unit, they will go into place without difficulty or force.

How Much Permissible Error?—This difference, or error, which can be tolerated below or above the required sizes of the spindles and the holes is known as the tolerance, or permissible difference.

Permissible error varies with different machining operations and on different machine tools. When grinding a pin, for instance, to fit into a hole, a variation of 0.0005-inch plus or minus from the absolute exactness is common. This means that all pins finished within the required five-ten thousandths limit will be considered acceptable by the inspector as far as the actual size of the pin and the hole is concerned, but not as to the clearance, or open space between the two parts.

The designation of "clearance" simply indicates differences in mating spindles and holes for such purposes as lubrication etc. To clarify this difference between tolerance and clearance, an example may be taken from a drawing which requires that a hole be made to measure between 1 27/32-inch and 2 inches. This means that the low limit for the hole is the former figure and the high limit is the latter one.

This has nothing to do, however, with the amount of error that can be tolerated either on the spindle or in the hole, and it indicates only the open space between the spindle and the hole. The smaller this open space is, the more accurate the hole and spindle will have to be; that is, the less permissible tolerance (error) must be allowed in the final dimensioning of each part.

To illustrate this relation between clearance (for lubrication) and final dimensioning of spindle and hole: If the permissible error on each part is 0.001-inch, and the permissible clearance between the two parts is only 0.002-inch, both parts can have the required tolerance of 0.001-inch and still the clearance can be as high as 0.004-inch.

Take Your Choice—The above situation brings up still another fundamental question in the vast area of tolerances and on which opinions sometimes differ. That is, the way the above variation in limits should be permitted. Some shop men, with many years of experience in making extremely close fits, split the allowable variation and permit their men to be half above and half below the basic dimension. They demand the application of the so-called "bilateral" tolerances. (Expressed: 0.001-inch plus or minus).

Other shop men prefer the so-called "unilateral" system in which the tolerance for the hole is from the basic up to the largest permissible diameter, and

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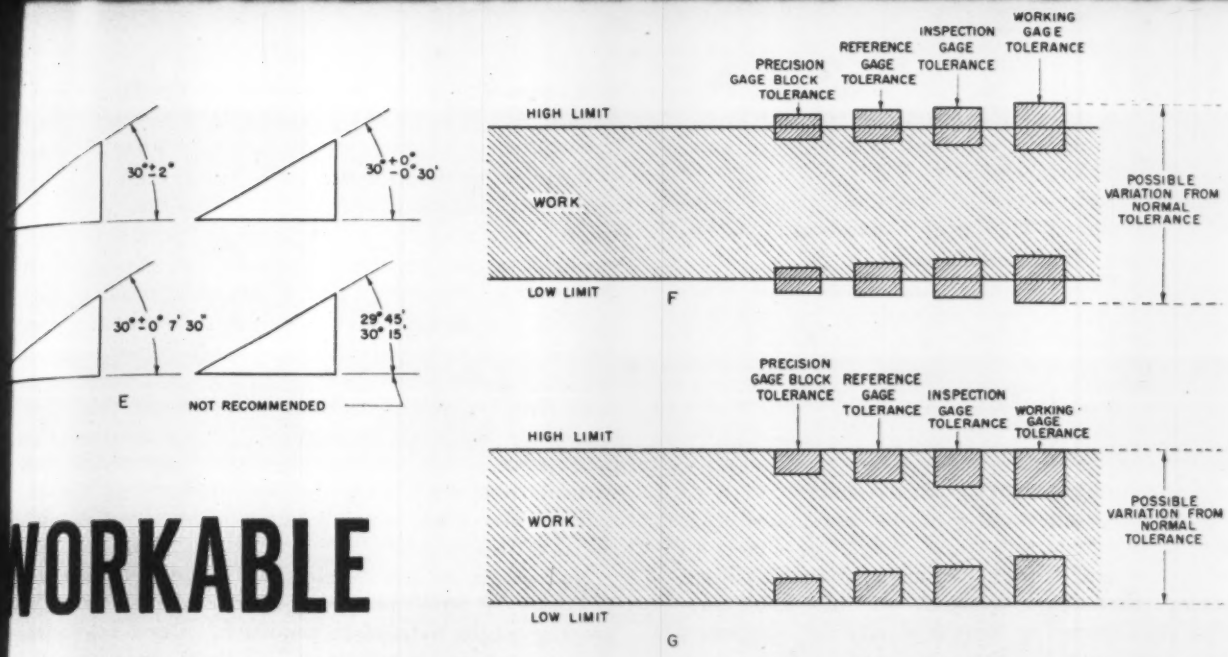

Various methods of indicating tolerances. (A) Minimum limit is placed above the line for all internal dimensions; maximum limit is above line for all external dimensions. (B) Example of loose fit, (C) example of medium fit, (D) A-B, clearance, B-A, interference. (E) Angular tolerances, (F) bilateral tolerances, (G) unilateral tolerances

ES WORKABLE

for the spindle from the largest possible diameter down to the smallest permissible size. In this case the tolerance must always be a plus in the hole and a minus in the spindle. (Expressed: Hole 2 + 0.002-inch; spindle 1.999—0.002 inch).

The Closer the Costlier—The smaller these differences, the more expensive it is to produce machined parts, since finer tolerances require more care in reaming, honing or grinding. More accurate measurements also require closer tolerances on finer gages, necessitate more care and time in setting the machines and tools; they increase the cost of inspection and in fact they may occasionally cause a higher percentage of spoiled workpieces.

Whenever a study of the most adequate tolerances is made in a shop it soon becomes evident that practically every workpiece should require special considerations in relation to other workpieces. The ideal procedure would be to analyze each workpiece and each dimension fully and then specify for each size of each workpiece its individual tolerance, and then insist that shop men maintain these requirements.

Endless Wrangling—Such a procedure would lead not only to endless controversies, but it would be an extremely difficult job. For instance, shops could give various interpretations to fitting a 1-inch shaft into a hole with a 0.0005-inch minimum clearance and a 0.002-inch maximum clearance. The shaft still could be made 0.9995-inch with a minus 0.0005-inch tolerance, and the hole 1.000-inch with a plus 0.001-inch tolerance. Or, the shaft could be made 0.9999-inch minus 0.0006-inch and the hole 0.0004-inch plus 0.0009-inch.

While all these variations would give satisfactory dimensions, the absence of well-defined tolerances could result in unnecessary misunderstandings, discussions, rejections, and increased production costs.

Systems Advantageous — These variations emphasize the advantages of using certain approved systems which aid in minimizing such and similar justifiable difficulties and permissible misunderstanding.

Similar values in standardized tolerances are now being worked out by various committees in co-operation with experienced technicians of the armed services.

Fewer gages can now be used, as the applicable dimensional combinations and tolerances have been considerably removed, resulting in more simplified measurements, eliminations of possible misunderstandings and in other obvious advantages.

Tolerances and Shop Economies—It is uneconomical and wasteful to maintain a rigid attitude in controlling accuracies within close tolerances on unimportant and nonfitting workpieces. On rough turning and grinding jobs, on workpieces coming off the moulding machine, the die casting machine, or the press, the maintenance of close tolerances means not only unnecessary waste of working time but also waste of tools, equipment, and manpower.

The situation is, of course, just the opposite when producing important parts, finished articles, and functional components. Here experienced shop men know that close tolerances are inextricably related to better production techniques. And as the need for increased production with the reduced forces in the shops is becoming more urgent every day, the accuracy of important workpieces must never be left to chance.

This Means Economy—Components are often sent thousands of miles away to be fitted into an operating unit which must function with the utmost precision in order to protect life and insure successful operation. Maintaining the required accuracy in such workpieces by keeping tolerances within the required

limits will not only help the shops to attain the highest standards in machining practices but it will assist management in its constant endeavor to turn them out still more economically.

If the highest production standards are maintained, acceptance of the largest number of workpieces is assured. This means economy.

If adherence to known tolerance standards is practiced methodically, better conservation of strategic materials is effected through a still greater reduction in rejects.

If, through such standards all workpieces meet the required accuracies, the proper functioning of the components is assured.

Interchangeability Insured—Standardized methods of applying uniform tolerance measurements will aid shops in their attempt to adopt markings which all shop men can easily learn to understand and follow, eliminating conflicting systems of indicating accuracies. Notations on drawings off the engineer's desk are more universally understood if expressions for tolerances become more standardized.

Acceptance and application of such standards in tolerances will also insure better interchangeability of mating parts as they are finished in the various shops in accordance with similar tolerance requirements.

Application and maintenance of standardized tolerances also require less supervision and insure quicker, safer and better inspection of the finished workpieces. Inaccuracies can be detected more quickly and they can be more definitely traced to their sources.

It's Not So Easy—Certain difficulties are encountered with the continued maintenance of standardized tolerances in all shops. This may be best explained by referring to one or two cases of manufacturing process. For instance, in a foundry so many different techniques are employed that no standardized tolerances have yet been set up which could be made acceptable to all shops. The quality of the castings depends on a large number of factors, which have important bearing on the difficulties referred to above.

To take another case, the thickness, hardness, and other characteristics of metals in punching operations are important influences on accuracies and tolerances which may be desired on bends, between draws, etc. In such cases experienced shop men find it best to work out their own tolerance requirements.

Variety Complicates the Job—Application of standardized tolerances is also often difficult in job shops where, regardless of the accuracies required of the workpieces, no empirical methods can be employed due to the large variety of workpieces passing daily through the shops. Here individual tolerances, gaging methods and instrumentations are usually worked out by each shop.

In many shops, variations between the high and low limits for various standardized workpieces often differ even in the minds of the most experienced and careful inspectors and the maintenance of the required tolerances in such cases often present additional difficulties.

No system of maintaining the necessary tolerance can ever be more precise than the system used for keeping gages in perfect condition. Good tolerances are, therefore, conditioned on good gage maintenance and control. Precision requirements in war materiel have introduced many new methods of gaging accuracy and tolerances through visual indicators, comparators, pressure and vacuum gages, plug, snap, ring, and thread gages; and many other sensitive and extremely accurate methods of instrumentation. These are being continually improved upon by the studies of experienced ordnance technicians.

Some of their recommendations can be found in the bibliography.

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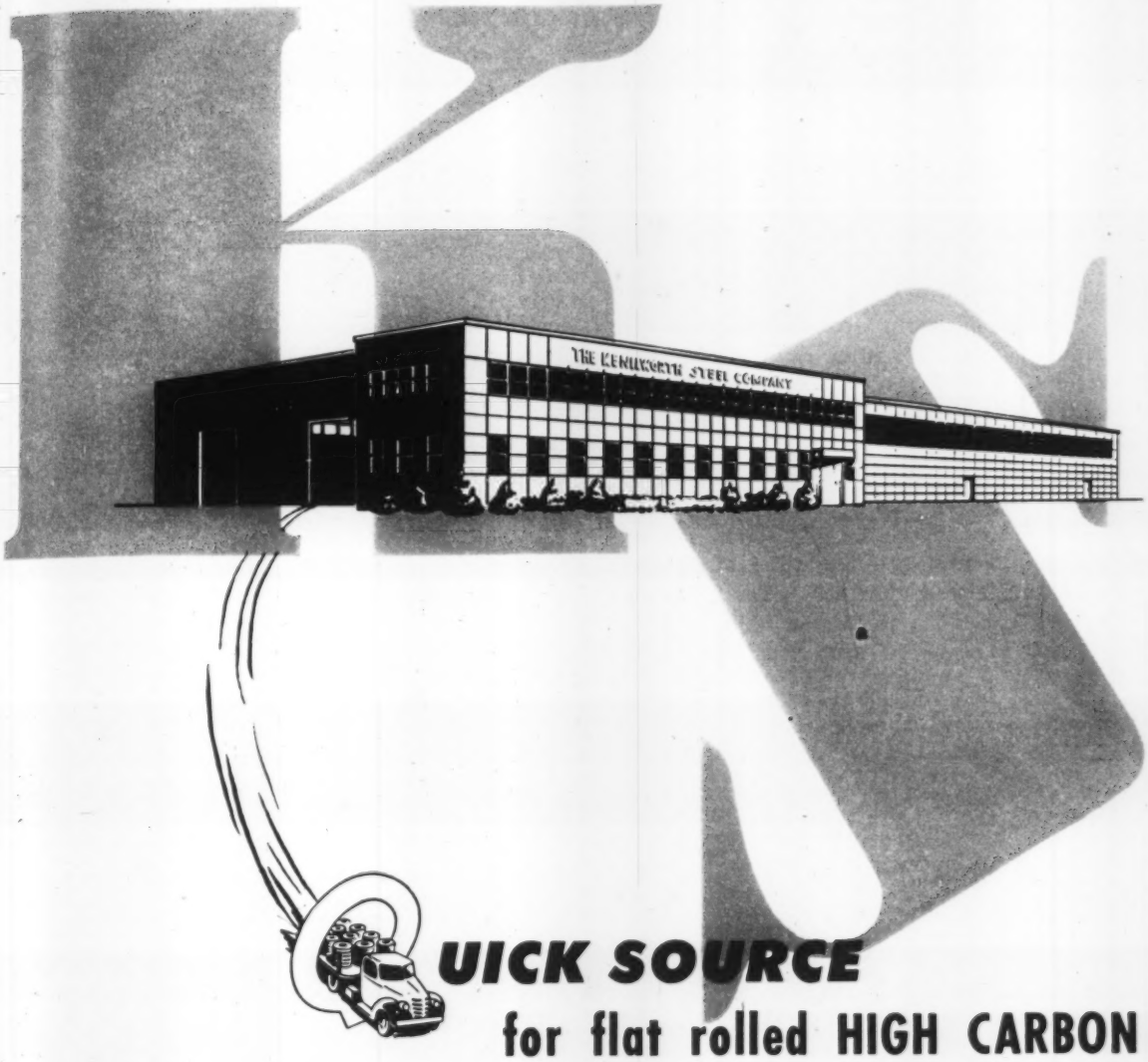
19. "Standards for Dimensioning and Tolerances", Army Ord. Class Div. 30-107

Overhead Fixtures Provide Good Light at Machine

Sufficient and properly distributed overhead lighting, providing a minimum of 40 foot-candles at working levels, often will dispense with the need for supplementary bench and machine lighting, as in the case of this new five-floor plant of a sewing machine manufacturer at Bridgeport, Conn.

Machining, assembling, inspection and shipping departments all are illuminated with rows of three-tube fluorescent fixtures on 8-foot centers both lengthwise and crosswise. Each fixture is plugged to an individual outlet, allowing easy relocation of the units. Chain mounted, the fixtures carry 3500 degree standard white lamps in open-end porcelain enameled reflectors.

The entire factory installation includes 1700 lighting units, supplied by Sylvania Electric Products Inc., while aisles, corridors and warehousing areas have additional two-lamp units. Overhead wiring seen here ultimately will be enclosed in conduit



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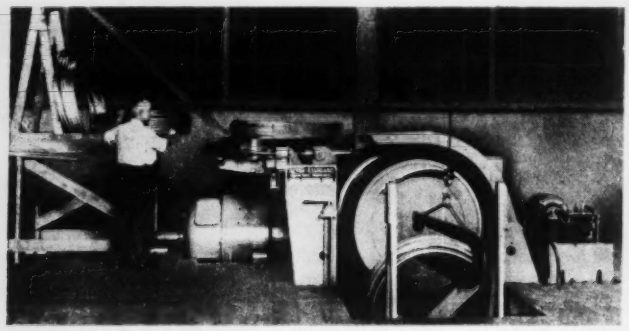
Continuous Bull Block Operation Speeds Output of Copper Tubing

Pointing and shearing of the tubing during processing eliminates much of the time usually lost in conventional drawing practice

GREATER production of drawn copper tubing due to a reduction of downtime in the drawing operation is directly attributable to continuous pointing and shearing of material during process in the newly designed horizontal bull block unveiled by Aetna-Standard Engineering Co., Youngstown.

The unit having pulls and speed range of 20,000 to 6800 pounds and 150 to 600 feet per minute, respectively, produces $\frac{3}{8}$-inch OD by 0.035-inch wall tubing in five passes from a starting tube of $1\frac{1}{8}$ inches OD by 0.070-inch wall thickness. The main operating motor is 100/125 horsepower, 300/1200 rpm, 230 volts which is operated from constant po-



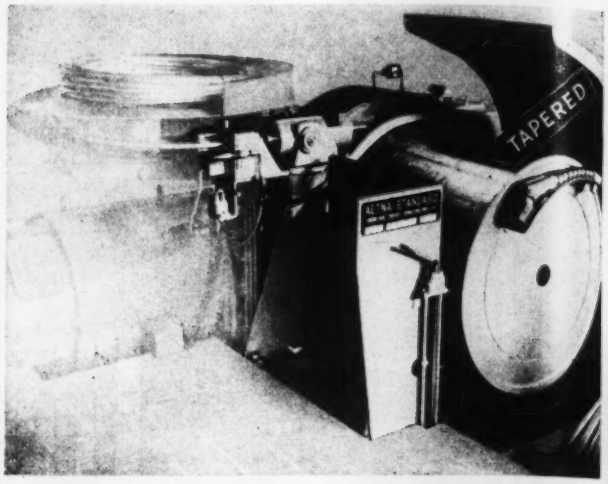
Bull block developed by Aetna-Standard showing the specially designed coil payoff unit, shear, push pointer, die block and tapered delivery drum

tential direct current shop power; no motor generator set is required.

Pay-off Integral with Block—To facilitate the handling of tubing at the entry end, the machine is equipped with a coil payoff of special design which is integral with the bull block. To assure easy removal of drawn tubing, a tapered drum is provided with a 48-inch diameter and 40-inch face. When a draw is complete, the operator is easily able to unload the coil due to the tapered design of the drum.

As material moves through machine, a shear cuts off trailing ends during drawing operation, and without stopping the block. A hydraulic push pointer with an integral die box, points tubing just prior to its drawing. By use of the push pointer and shear, all manual handling of the coil between draws is eliminated.

If drawing from coiled tubing, the operator places the coil in the payoff; the end of the tube is then fitted over a conically shaped lubricating insert, with which the drawing lubricant is injected into the copper tube.



To eliminate need of coil push-off, the bull block is equipped with a tapered drum. When drawing is finished, the tapered design enables the operator to unload the coil with ease

If operator is drawing from straight lengths, the end of the tube is merely advanced forward and the operator proceeds as above.

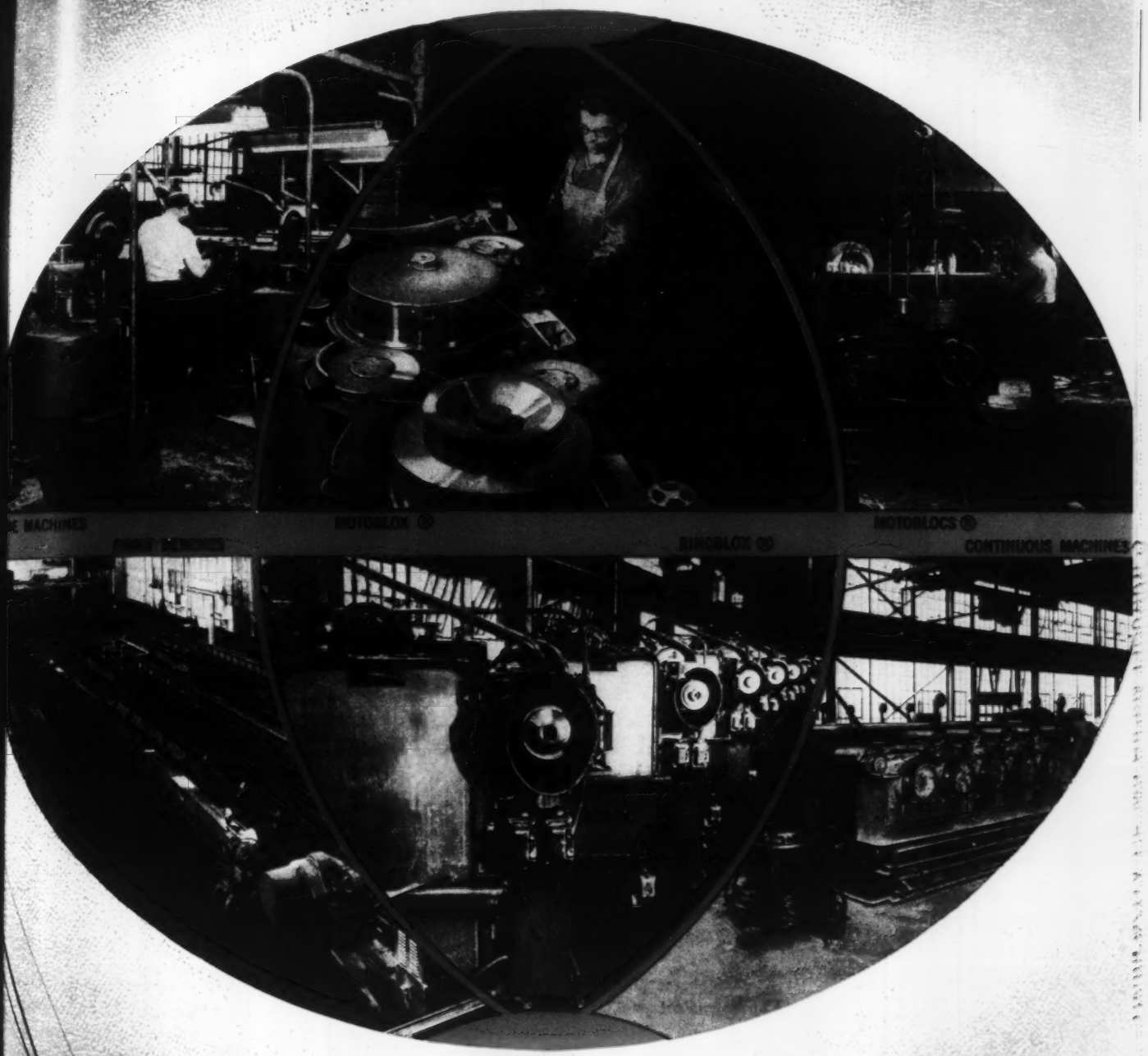
Pushbutton Control Utilized—The floating plug is then inserted into the end of the tube, after which the tube is advanced through the shear (now in open position) into the push pointer. By means of pushbutton control the push pointer is operated to grip the tube and force its end through the die. The end of the tube is thus advanced into the gripper jaws and the drawing operation is started by use of the "start" button to accelerate the block to pre-selected drawing speed.

Near the end of the draw, the operator shears the trailing end of the tube by use of the crop shear which operates with the draw in progress. When the end of the tube is pulled through the die, the block is stopped by dynamic braking of the main motor. The loose coil is then removed from the tapered drum and the operator is now ready to prepare for the next coil.

Storage Procedure—Coils in process are stored in a convenient manner between the payoff and the coil unloading point. Normal procedure would involve running a large number of tubes through the first pass on the bull block to storage. These tubes would then be in process; the next operation would be to run the entire lot through the second pass, and so on until the required number of draws had been completed.

Roller Chains Now Packaged

Packaging of the complete line of Morse roller chains and parts, made by Morse Chain Co., Detroit, a division of Borg-Warner Corp., is expected to expedite shipping, storage and ordering of chains and parts besides reducing handling costs. Items being packaged are dipped in a rust preventing lubricant at the factory before shipment. Individual corrugated cardboard cartons of sturdy construction are plainly labeled.



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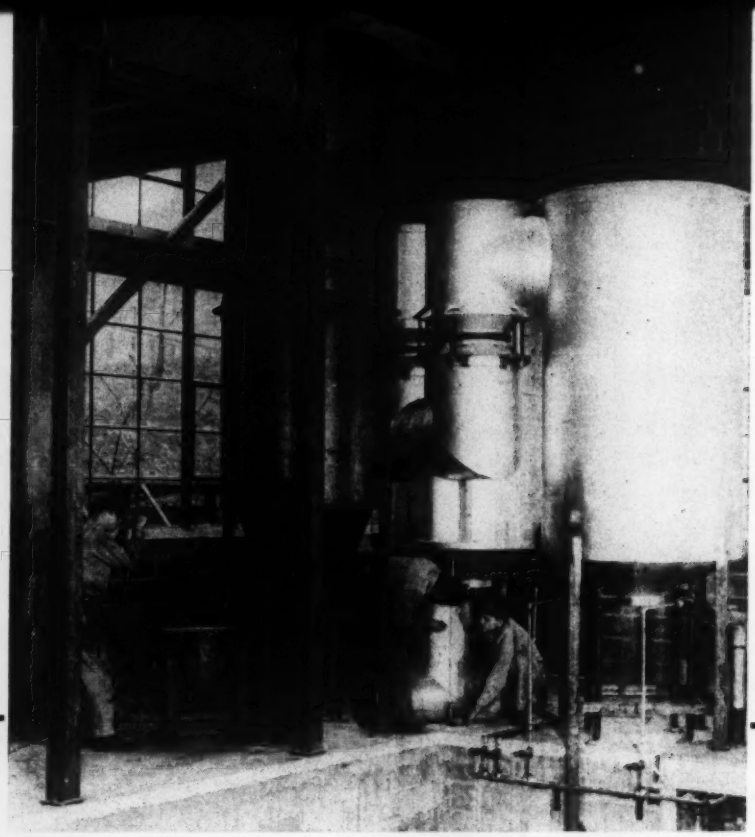


Experimental blast furnace (unpainted) served by two pebble hot blast stoves capable of delivering air at 3000° F

Dwindling Stocks Spur Manganese Recovery from Slag

Bureau of Mines actively engaged in developing process for reclaiming manganese from open hearth slags to offset shortage due to accelerated steelmaking activities

By RUSSELL C. BUEHL

Supervising Engineer,
Metallurgy of Steel Section
Bureau of Mines
Pittsburgh

SHORTAGE of manganese due to cutoff imports from Russia and increased consumption of an expanded steel industry is spurring efforts of the Bureau of Mines to develop a process for economically recovering the element from open hearth slags.

Research on the process, aided by steel industry dollars, already has reached the point where experimental work is being done in connection with bessemer operations. In addition an experimental blast furnace is being erected at Pittsburgh to perfect the first step of the process.

Open hearth slags discarded every year constitute a potential source of manganese sufficient to supply the steel industry. However, the low manganese content of such slags and the relatively high phosphorus content makes development of an economic recovery process a difficult research project.

Work of the Metallurgy of Steel Section, Bureau of Mines, Pittsburgh, promises to be a practical solution to the critical manganese shortage. Actively aiding the cause technically is a committee of the American Iron and Steel Institute. The AISI representing the steel industry, also is providing considerable funds for the work.

Country Dependent on Imported Ore—During the past few years manganese ore imported into the United States was approximately 1,200,000 short tons per year. In 1948, 427,000 short tons or one-third of the imports came from the U.S.S.R., but this decreased to 81,500 tons in 1949. Although other sources of supply correspondingly increased to make up for the loss of Russian ore, ore from many of the present sources might be cut off in case of a world conflict. While the United States has large deposits of manganese ore, they are for the most part low grade. Increased consumption of manganese in recent years as a result of the expansion of the steel industry has prevented the creation of adequate stock piles of manganese ore. At the end of 1949, about one year's supply was in stock.

Iron ore from the Great Lakes deposits used in pig iron blast furnace production contains about the same tonnage of manganese as the total imports into the United States. This manganese is largely re-

MAINTENANCE CUT

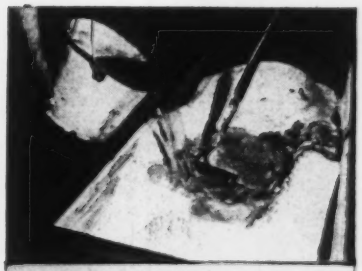
Several Thousand Dollars Per Year with **KAOCAST**

Photographs courtesy Ford Motor Company

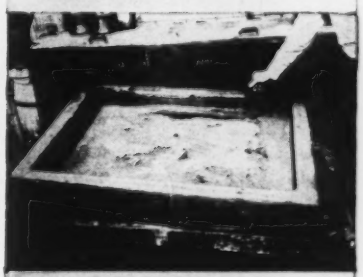
A large automobile manufacturing firm found that high temperatures and severe operating conditions were playing havoc with the doors of their 15-ton electric furnaces. Run 16 hours a day, 5 days a week, these furnaces are poured every 2½ hours and are charged twice during each cycle. With a good grade of firebrick, furnace door linings lasted an average of only two or three days before replacements were necessary.

A trial installation of KAOCAST—the B&W high temperature Refractory Castable—was made. The KAOCAST doors stood up two to three weeks . . . *five to eight times longer than firebrick.* As a result, doors on all electric furnaces of this type are now lined with KAOCAST. *Savings in maintenance are running into thousands of dollars per year.*

Your B&W Refractories Engineer will be glad to show how KAOCAST will cut your furnace operating cost. Write or call him today.



KAOCAST, easy to use as ordinary concrete, can be mixed in mortar box or concrete mixer.



Shell of furnace door, cleaned, ready for installation of KAOCAST.

Shoveling KAOCAST into place. KAOCAST can also be poured like ordinary concrete, plastered in place, or applied with a cement gun.

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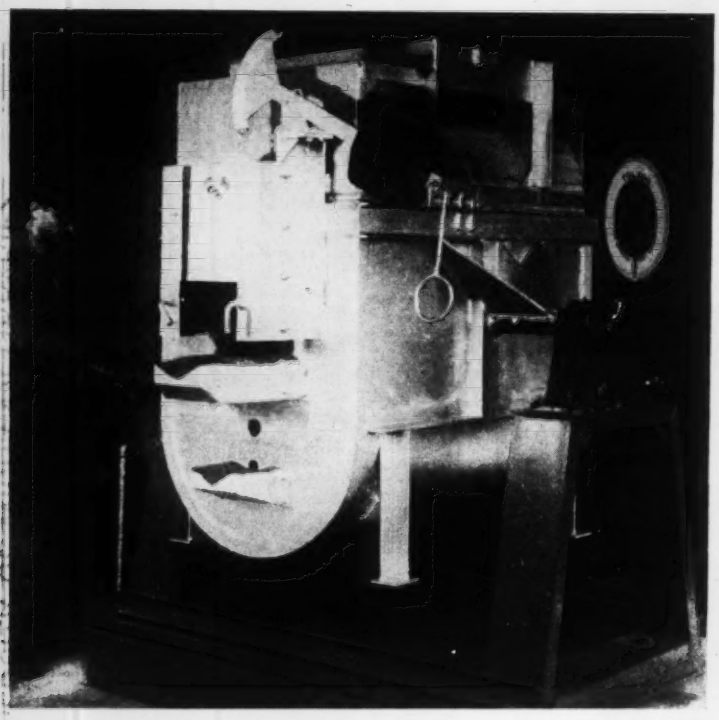
R-339

duced to metal along with the iron in the blast furnace and appears in the pig iron. However, in converting pig iron into steel, manganese is oxidized and appears in the slag. Only a small percentage remains in the metal where it is desired.

Will Utilize Flush Slags—Slag removed from an open-hearth furnace during the early phases of the heat, so-called flush slag, contains more manganese and less phosphorus in proportion to the manganese than the final or finishing slags. Such flush slags would therefore be utilized first in manganese recovery processes.

A typical flush slag contains the oxides of the more easily reducible metals in the following concentration: Manganese, 9 to 12 per cent; 20 to 30 per cent iron; 1.25 to 1.75 per cent phosphorus; and, in addition, approximately 20 per cent silica; 5 per cent aluminum; and 25 per cent lime and magnesia. This latter group are not readily reduced from the slag in appreciable amounts and are termed the slag forming constituents.



Basic-lined converter built with a single tuyere beneath pouring spout. Unit is mounted on platform scale to provide accurate weights during tests

As the slag forming constituents, silica, lime, magnesia, and alumina, constitute 50 per cent or more of open-hearth slag, it is proposed in the Bureau of Mines process to reject them by first reducing the open-hearth slag in a blast furnace. The iron, manganese, and phosphorus will be present in a metal analyzing about 20 per cent manganese, 2 to 4 per cent phosphorus, 1 to 2 per cent silicon, 4.5 per cent carbon, and the balance iron. The second step of the process consists in blowing just enough air through the metal in a converter to produce a high manganese slag. Iron and phosphorus remain as metals. The entire process would also be applicable to the recovery of manganese from manganiferous iron ore, of which large deposits exist in several parts of the country.

Although open-hearth slag is added to the blast furnace charge of many plants, its use is generally limited to less than 20 per cent of the ore burden. The large proportion of nonreducible oxides in open-hearth slag presents a problem. The open-hearth slag composition mentioned in the foregoing would result in more than 3000 pounds of blast furnace slag per short ton of metal. When one considers that the slag discarded from blast furnaces producing ferromanganese often contains 8 per cent manganese, the difficulty of obtaining a reasonable recovery of manganese from a material with only 9 to 12 per cent manganese is readily appreciated. Consequently, a major portion of the research problem is to determine a satisfactory blast furnace procedure for the recovery of manganese from such large slag volumes.

Experimental Blast Furnace—To perfect the first step of the process, an experimental blast furnace is being erected at Pittsburgh as rapidly as materials and equipment can be secured. One unusual feature of this furnace is the use of pebble stoves (often called Royster stoves) for heating the air blast. These are contained in the two aluminum painted metal cylinders adjacent to the blast furnace (unpainted). By means of these stoves, it is expected to obtain hot blast temperatures as high as 3000 ° F. The stoves are lined with mullite brick backed with 7 inches of insulating brick and filled with spheres of high purity alumina about 1-inch diameter. The stoves are heated by a burner from above and blown from below in a reversible cycle. Automatic valves operated from a time cycle controller will be used to reverse the flow through the stoves. Consequently, the stoves can easily be operated on a relatively short time cycle if desired.

The furnace has a height of 10 feet from the tuyere to the stockline. The diameter of the stack inside the brick is 2 feet, 8 inches, while the diameter at the tuyere is only 16⅝ inches. To reduce heat loss from the blast, only one 4-inch inside diameter tuyere is used. Because of the small size of the hearth, it is anticipated that the furnace will have to be tapped frequently, possibly every 10 minutes. The compressors will provide 600 cfm blast and will consume about 8 tons of coke per day.

Experimental Converter—The converter operations performed in connection with this program differ from normal bessemer practice in many respects. Manganese oxide is strongly basic and attacks silica or clay brick. However, a good grade of magnesia brick is resistant to such slags and such a basic lined converter must be used. Unlike most converter operations, the analysis, properties, and recovery of the slag rather than of the metal are the important factors. Slags high in manganese oxide are viscous even at temperatures as high as 3000° F and would therefore crust over rapidly in an open top converter. A special converter with good thermal insulation was therefore built. This is mounted on a platform scale

to obtain accurate weights during a test run. The vertical cross section of the interior of the furnace has the shape of a rectangle with semicircular bottom and top. It is 13½ inches wide, 27 inches deep, and 42 inches high. A single tuyere, which is nearly horizontal, is located under the pouring spout. The furnace is tilted forward slightly during blowing cycle so that the tuyere is below the top level of the metal. Manganese is selectively oxidized from a charge of 500 to 600 pounds of metal in 15 to 20 minutes.

The length of the blowing period must be carefully regulated to selectively oxidize manganese and leave iron and phosphorus as metals. The separation must be complete, that is, 98 per cent of the iron and phosphorus must remain as metal in order to produce a satisfactory slag for the production of ferromanganese of about 80 per cent manganese and an acceptable low phosphorus content. A new procedure has been devised whereby this becomes possible. By following this method, synthetic ferromanganese ores have been produced with a considerably higher (55 to 63 per cent) manganese content than natural ore of about 48 per cent.

Other Research on Manganese—In addition to the research on the recovery of manganese from slags described in this article, the Bureau of Mines is engaged in extensive manganese investigations at several other stations. At the College Park, Md., station, other means are being studied for recovering manganese from slags, such as magnetic concentration following special thermal treatment to separate the slag into two crystalline components; leaching methods; and volatilization of manganese. A concentration plant capable of treating around 50 tons per day of low-grade manganese ore is to be constructed near the Artillery Peak manganese deposits of Arizona. Special means for utilizing low-grade manganese and manganiferous iron ores are also being investigated. Tests on the effect of small manganese additions on the processing and properties of steel are in progress at the Redding, Calif., station of the Bureau of Mines.

Large Rivet Standard Revised

Containing the dimensions before and after driving, shape, tolerances, finish and for various styles of rivets is the revised American standard for large rivets, ½-inch nominal diameter and larger, approved by American Standards Association, New York. Types included are button head, high button head acorn, flat-top counter-

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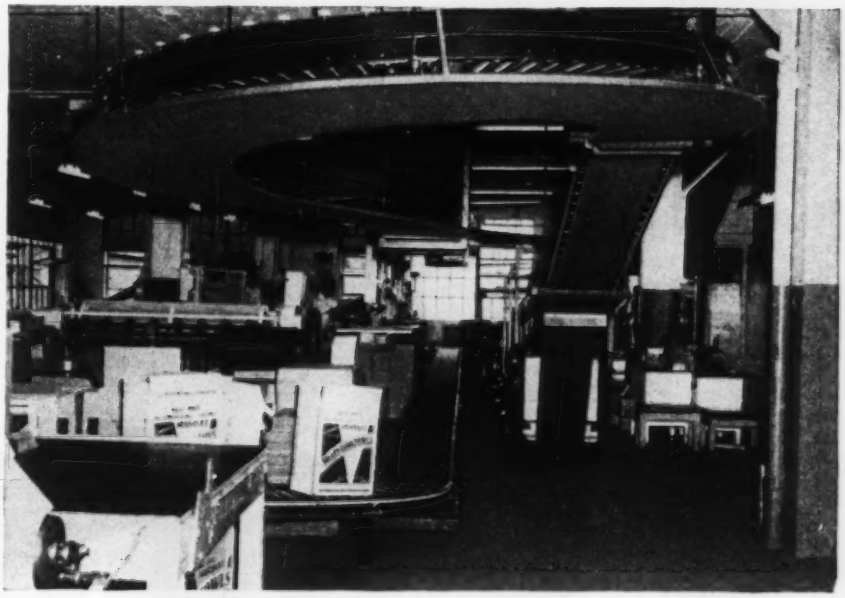

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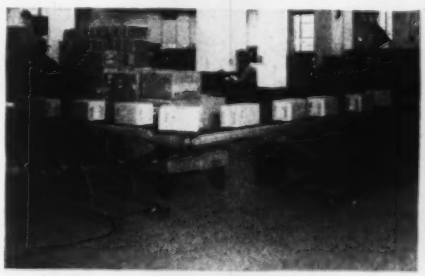

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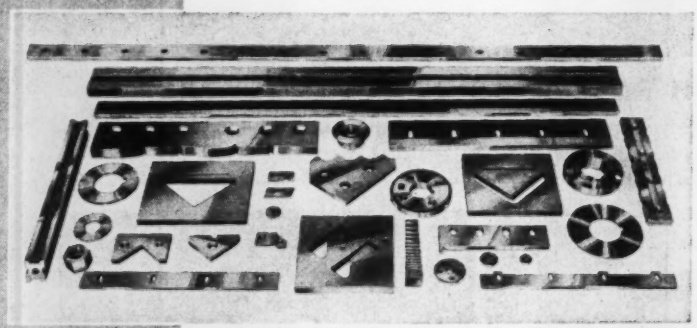

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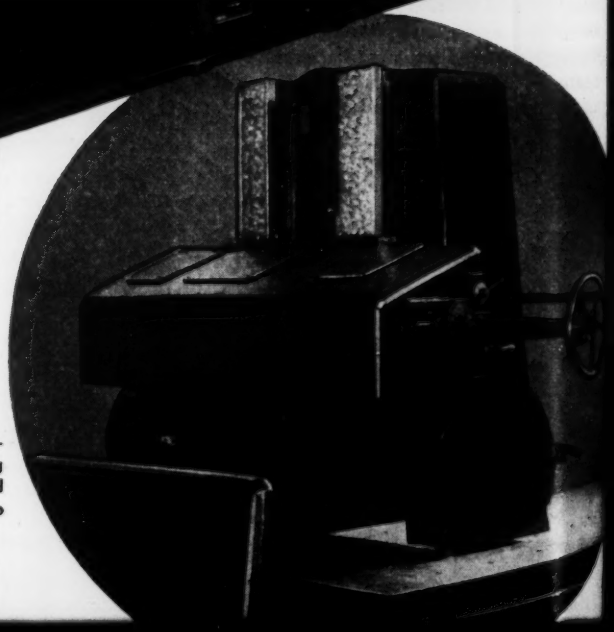

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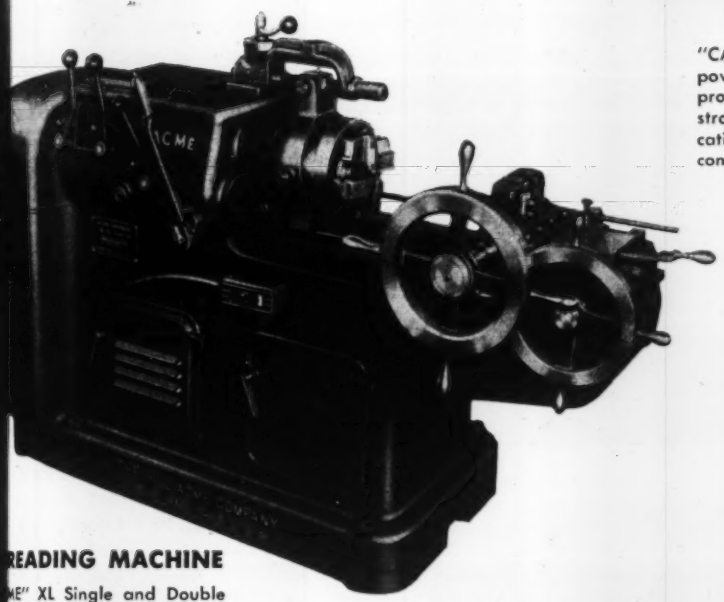

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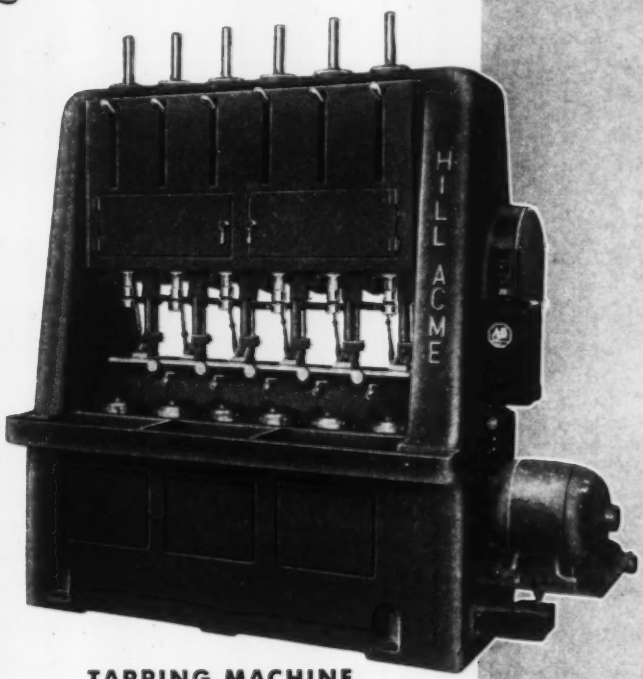

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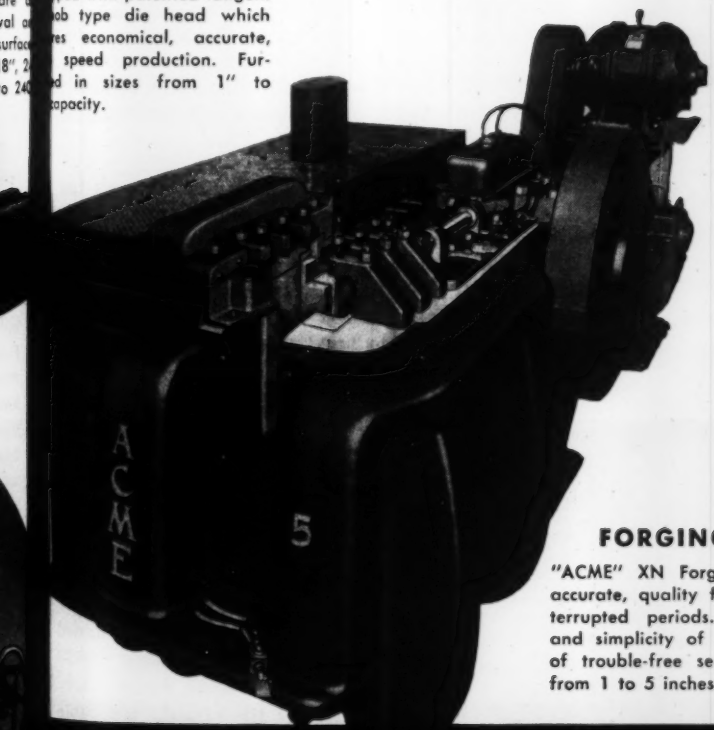

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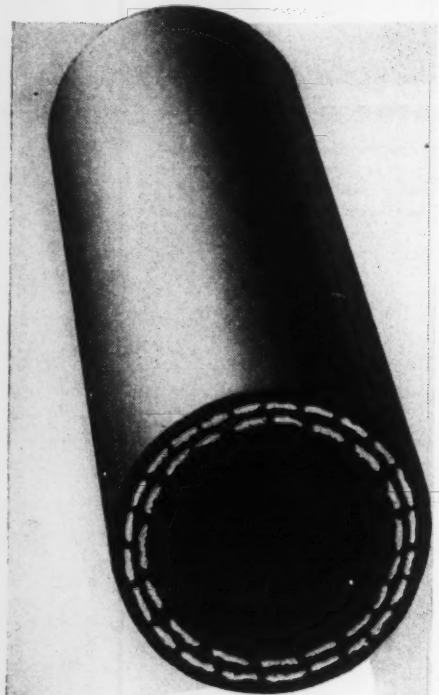

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BULLETIN 137 gives complete data —ID, OD, working pressures, reel lengths, etc. Call your Hewitt Rubber distributor (see "Rubber Products" in classified 'phone book) or write Hewitt Rubber Division, 240 Kensington Ave., Buffalo 5, N.Y.

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sunk head, round-top countersunk head, cone head and pan head. Major dimensional change in the new edition concerns pan-head rivets, which were revised to conform with Bureau of Shipping and U. S. Navy design.

Longer Wearing Centers

Factors which would lead you to use carbide-tipped lathe and grinder centers might include the possibility of exerting more pressure on the centers without danger of scoring or burning and the increased resistance to the wearing action of abrasive products caused by grinding operations. According to Carboloy Co. Inc., Detroit, it has been determined that the life of carbide centers between reconditionings should be about 50 to 100 times that of other materials.

Other factors to be considered are correct design of the center and proper maintenance. It is said that the portion of the center carrying the load should have as close to 100 per cent bearing surface as possible. Also to be considered is the depth to which the carbide tips are set into the steel shanks. This should be great enough so that the tips can be reconditioned when worn by grinding back on the original angles without reducing the maximum tip diameter. Precaution should also be taken that the tip is not struck or bumped.

For refinishing, the company advises that the center can be mounted in the workhead of either a cylindrical grinder or a tool and cutter grinder, the center being rotated and ground the same time with a 220-grit diamond wheel operating on the slowly rotating center. After the tip has been ground, or lapped if it is necessary to remove grind marks, the sharp point should be broken slightly with either a diamond or silicon carbide hand hone.

Aluminum Extrusion in Design

Advantages gained from the use of extruded aluminum shapes is broken down into eight principles of design in the latest edition of the 138-page book *Designing With Aluminum Extrusions,* offered by Reynolds Metals Co., Louisville, Ky. Each of these principles is illustrated and explained in detail by use of diagrams, charts and pictures of actual parts.

In addition, the book, available without charge to engineers, architects, designers, contains the tabular sections of 16 tables of data on chemical, mechanical and physical properties of aluminum and extrusion process data such as minimum thick-

ness, maximum lengths, tolerances, difficulty factors, etc. Condensations of finishes and joining methods form two tables. Measuring 6 x 9 inches, it has an itemized cross index covering text, illustrations and tables. It is available from the company, 2400 S. Third St., Louisville 1, Ky.

Drill Steel Life Prolonged

General abuse in handling and poor drilling practice—drilling with dull bits or excessive or too little air pressure—are primary causes of drill rod failure, according to C. W. Darby and R. M. Simpson, Crucible Steel Co. of America. One remedy is to select the bit that tests have proved to be fitted for the job.

Speaking before the American Mining Congress, they reported that drill rod life can also be prolonged by proper forging and heat treatment. Besides hardness, other advantages of using alloyed steel are greater tensile strength, higher yield strength and faster drilling strength.

Improving Metals by Forging

Steel Improvement & Forge Co., 970 E. 64th St., Cleveland 3, O., is making available a 44-page catalog on shaping and improving of metals by forming. Included are pictures of methods used, including designing, die sinking, drop forging, heat treating and inspection for quality control. Also included are tables of the characteristics and applications of commercial forging metals and standard tolerances for drop forgings.

Heating Control Self-Powered

Requiring no other source of electrical energy except that generated by the pilot flame is a self-powered control system for gas heating reported at the exposition of the Gas Appliance Manufacturers Association in Atlantic City, N. J., recently. Called the Powerpile and made by Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., the device assures that power failure will not hinder operation of a heating plant.

Process Cleans Fine Coal

New process for the combined cleaning and dewatering of fine sizes of coal is said to be closer to commercial application as a result of the Bureau of Mines experiments undertaken in co-operation with private industry.

To test the practicability of a kerosene-flotation process capable of

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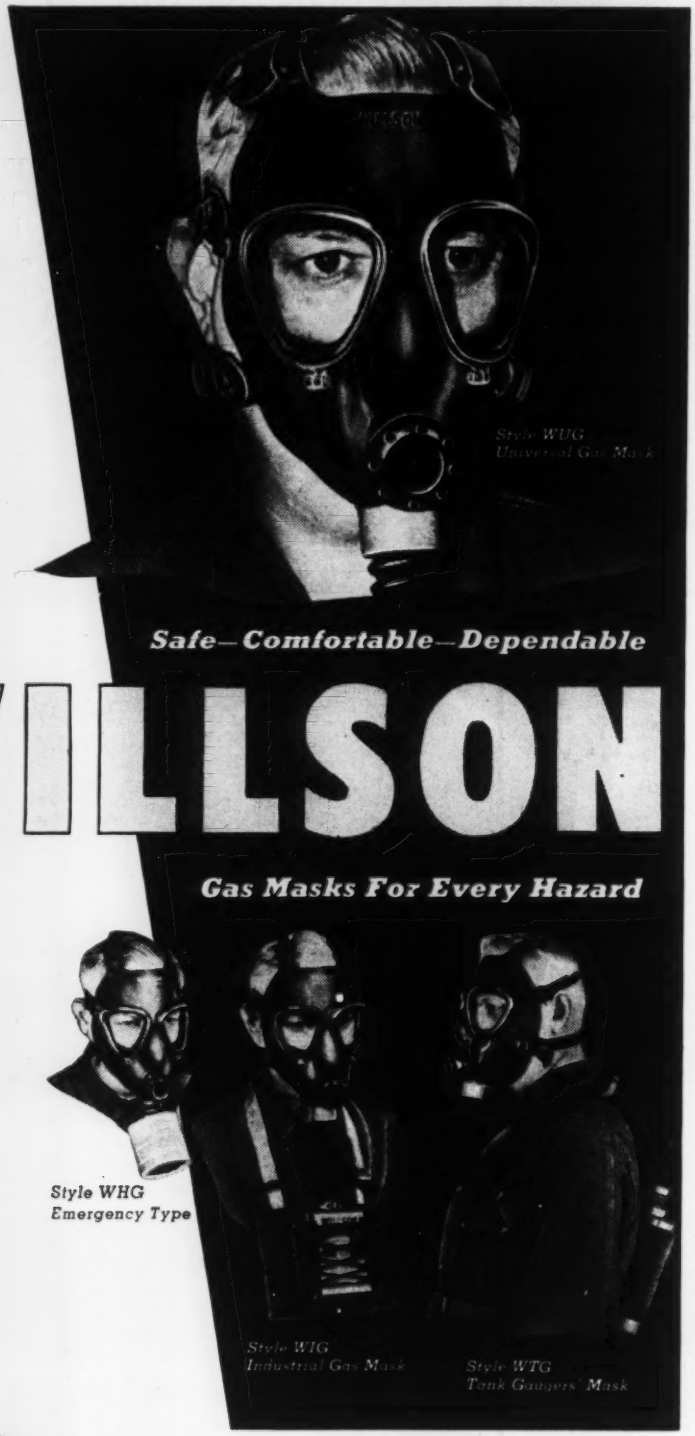

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cleaning and dewatering smaller sizes of coal in a combined operation, the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., constructed two plants. Both are demonstrating that the process compares favorably with more conventional methods, according to a report of investigation 4707, available from Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa.

Standardize Blueprint Terms

Work on a complete list of standard names and definitions to make it possible to order duplicate prints of engineering drawings by a standard name is being rushed because of the present defense emergency. A project of the International Association of Blue Print and Allied Industries, Chicago, the list being compiled is expected to cut through the confusion caused by many trade names and processes. Although the common "blueprint" won't stand much changing, the direct positive diazo-type ammonia developed blue line on foil is to be simplified, the association reports.

Standard terms are the first step in the preparation of a reproduction manual, these to be released to users of reproductions before publication of the manual. The association will welcome suggestions on the standard names, particularly if you are accustomed to ordering by certain names. It is said that the most common term will be used where possible. Address of the association is 506 S. Wabash Ave., Chicago 5, Ill.

Determination Symposium

Possibilities and limitations of electronic measuring and recording devices is the subject of four technical papers and discussions comprising a symposium presented at the first American Society for Testing Materials Pacific Area national meeting in San Francisco last year. Copies of the 64-page publication are available from the society, 1916 Race St., Philadelphia 3, Pa., for $1.50.

Improve Inventory Control

Designed to improve managerial control over purchasing and manufacturing orders are two recently developed calculators, one answering the question "How much to buy?" and the other "How much to make?". Available from Van D. Mark of Springfield, O., the calculators are designed around accredited ideal lot-size formulas, reducing these to routine simplicity.

The purchasing calculator is said

to tell how far to go in accepting supplier discounts while the manufacturing units gives the exact amount to make. Easy to read and use, the calculators are made of laminated plastic so that the printing will not fade or scratch off.

Agenda of Maintenance Show

Taking place during the first three days of the Plant Maintenance Show, to be held Jan. 15 to 18 in Cleveland is a maintenance conference. An 18-point program of plant maintenance techniques has been set for discussion at this series of meetings. Four general sessions will be held for all visitors and eight sectional conferences for executives and engineers with specialized problems.

Among the subjects to be covered are: Preventive maintenance, organization, management for maintenance, lubrication, housekeeping and small plant maintenance. General conferences will start with a discussion of preventive maintenance and speakers will discuss inspection procedures and frequencies, reports and records and training personnel for maintenance work. This group will then divide for four sectional meetings on maintenance of electrical equipment, power plant and heating equipment, maintenance problems of the small plant, and maintenance and selection of lighting equipment.

Second day of the general session will be devoted to organization and management for maintenance, this including maintenance costs and their control and budgeting, incentive payment of maintenance workers, and planning and scheduling maintenance operations. Panel on the third day, conducted by American Society of Lubrication Engineers will be on the subject of lubrication. Another general session will be devoted to plant housekeeping. The exposition itself is expected to be two to three times as large as in 1950.

Strength of Stainless Members

Method of evaluating the structural characteristics of stainless steel is a need fulfilled by a new book, *Strength of Stainless Steel Structural Members as Function of Design*, published by Allegheny Ludlum Steel Corp., Pittsburgh. It is said that the procedures put forth should allow designers to explore additional applications of the material for airplanes, buses, railroad cars, bridges and similar applications.

Written by Dr. Michael Watter, director of research of Budd Co., and R. A. Lincoln, metallurgist for Alle-

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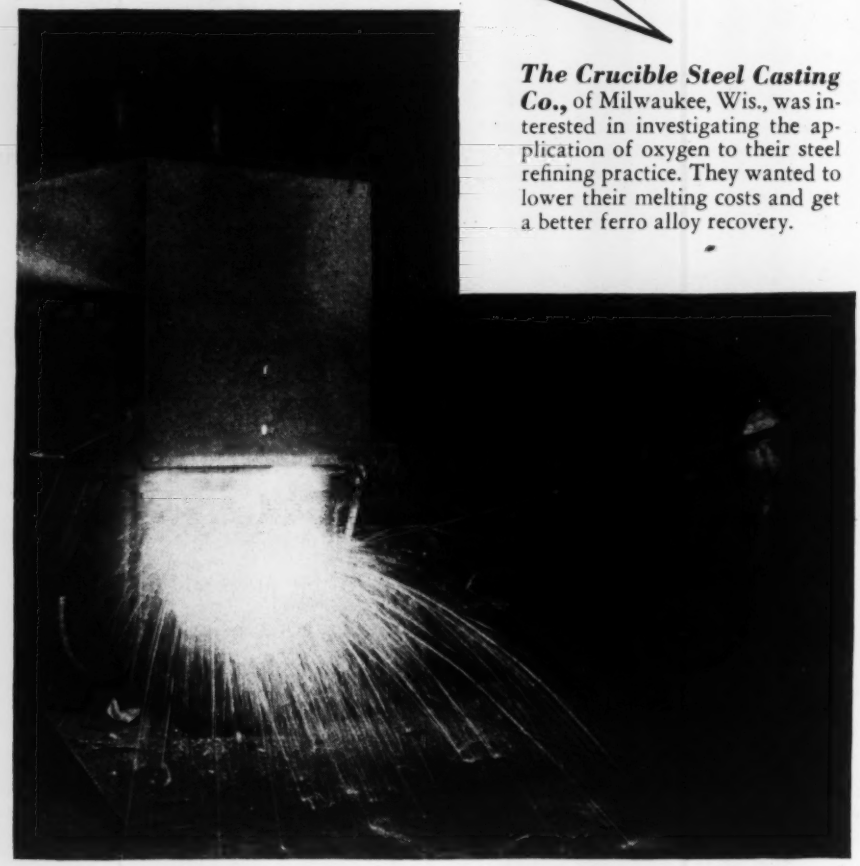
Oxygen Refining lowers melting cost... permits better ferro alloy recovery... improves refractory life



The Crucible Steel Casting Co., of Milwaukee, Wis., was interested in investigating the application of oxygen to their steel refining practice. They wanted to lower their melting costs and get a better ferro alloy recovery.

Clarence Nolan, Airco Technical Sales Supervisor, was called in to demonstrate the use of oxygen in refining acid steel. On his advice, a number of test heats were made in which Airco 99.5% pure oxygen was injected into the molten bath. These tests proved that substantial savings in heat time and power could be realized by adopting this method of refining. When the operation was put in general practice, it was found that in addition to the above savings, it offered better metal analysis control, improved refractory life and further savings through higher recovery of ferro alloys.

Additional savings were also enjoyed when the problem of handling and storing iron ore was eliminated.

For technical assistance or a copy of our folder "Oxygen In The Electric Furnace", please write your nearest Airco office.

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gheny Ludlum, the book presumes a knowledge of mechanics and stress analysis; therefore it will have little appeal for the layman. A method of stress analysis is developed and checked against empirical results. Nomographs are given to aid the designer.

Refractory Has Mullite Base

A refractory material that will not melt until heated to more than 3300° F, a point nearly one-third higher than the melting point of steel, is being produced from a base of mullite, a tough crystalline compound recognized as a durable refractory material for severe furnace conditions.

To be known at Allmul, the new refractory, when heated to 3000° F in firebrick form, reportedly will support 1000 pounds without deforming and when successively heated to 2550° F and sprayed with cold water a dozen times shows no cracking or chipping. It is said that these characteristics permit furnaces using this material to be operated at higher and more efficient temperatures for a longer period of time without maintenance interruptions.

Allmul will be produced in quantity at the Augusta, Ga., plant of the Refractories Division of Babcock & Wilcox Co., New York. Material is expected to see service in the steel, nonferrous metal, chemical and other industries. It will be manufactured principally in the form of firebrick, but will also be available in the form of grain and ramming mixes.

Roofing Standard Approved

Having obtained approval, simplified practice recommendation R78-28, formed iron and steel roofings, siding and ridge roll now is effective, according to Commodity Standards Division, U. S. Department of Commerce, Washington 25, D. C. It consists of a simplified list of widths, lengths and gages of corrugated v-crimp, pressed standing seam and roll, formed iron and steel roofing, galvanized or painted, as well as siding and ridge roll.

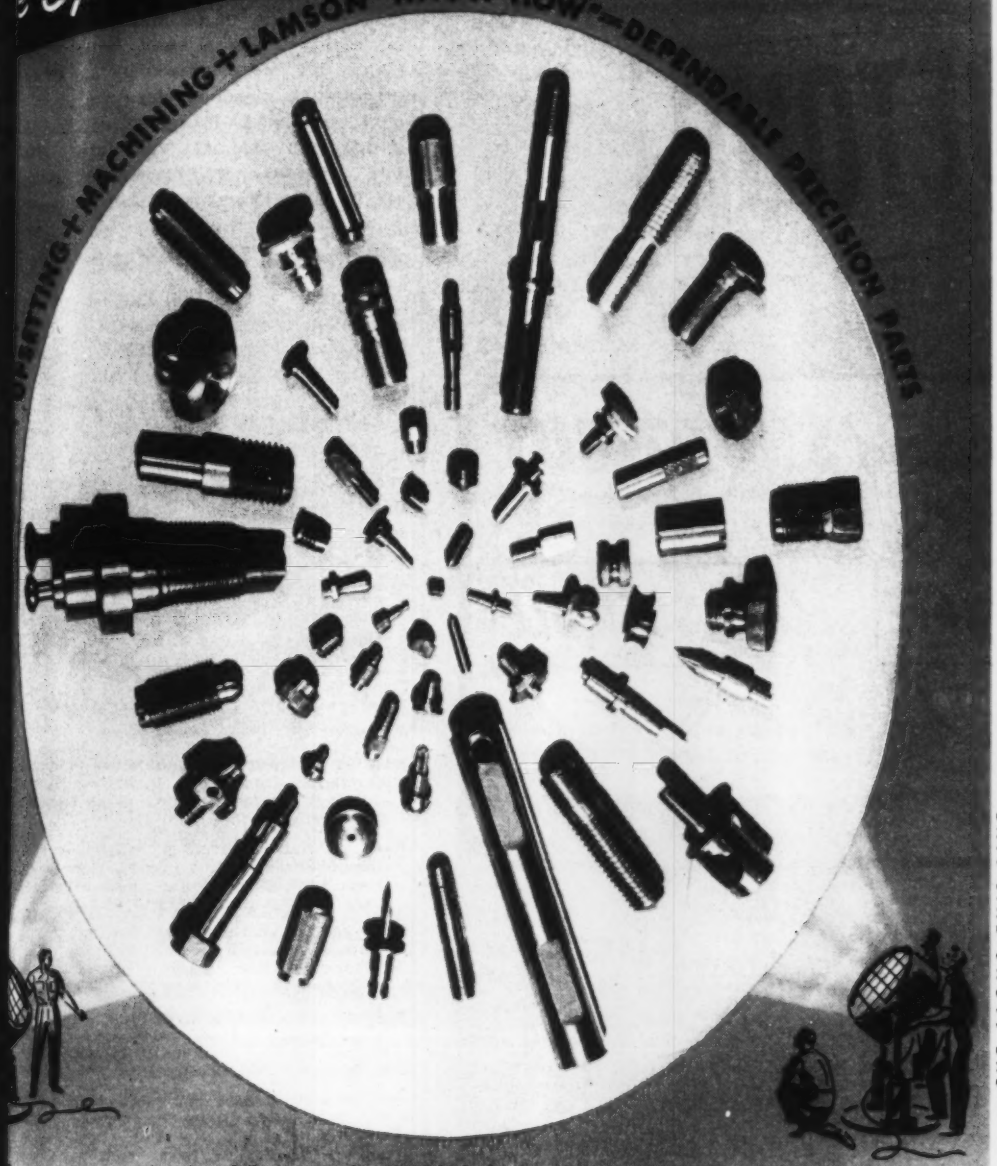
Sensitively Measures Radiation

Accurately measuring all types and quantities of atomic radiation is a sensitive instrument being produced in quantity by the Meter Division of Westinghouse Electric Corp., Pittsburgh. Developed by the company's engineers working in co-operation with the Navy and Signal Corps, it is called the universal roentegen meter.

Instrument's reading reveals how

e Spotlight's on "Specials" BY LAMSON!

UPSETTING + MACHINING + LAMSON "KNOW HOW" = DEPENDABLE PRECISION PARTS



course you think of Lamson for headed fasteners.

But did you know that Lamson produces precision Screw Machine Products for many of the country's best known, "blue ribbon" manufacturers?

Within this one organization are modern facilities for hot and d heading, machining, grinding, broaching, bending, flattening, punching, drilling, heat-treating and plating.

Add to these facilities Lamson's unsurpassed "know how" and you'll understand why it's wise to check with Lamson *first* for small parts production . . . Screw Machine, Upset or a combination.

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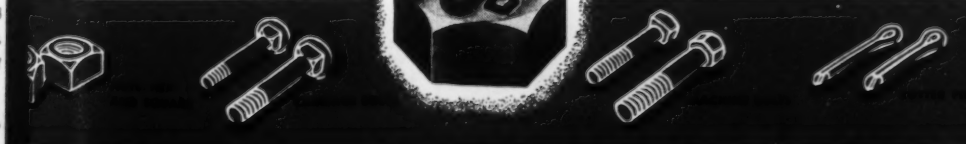

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.CUT ALONG THIS LINE.

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LAMSON LOCK NUTS: Economical, vibration-proof. Can be re-used repeatedly.

"1035" SET SCREWS: Cup point type, hardened, heat-treated.

COTTER PINS: Steel, Brass, Aluminum and Stainless Steel.

SPECIAL NUTS: Cone, Barrel, Oblong, Plier, Tri-Slot, Half-round, etc.

PHILLIPS AND CLUTCH HEAD: Machine Screws and Tapping Screws.

MILLED STUDS: Concentric, accurate, in a full range of sizes.

"BENT" BOLTS: Including U Bolts, Eye Bolts, Hook Bolts, etc.

WEATHER-TIGHT BOLTS: Eliminate counter-boring in wood assemblies.

PIPE PLUGS: Forged Steel, heat-treated.

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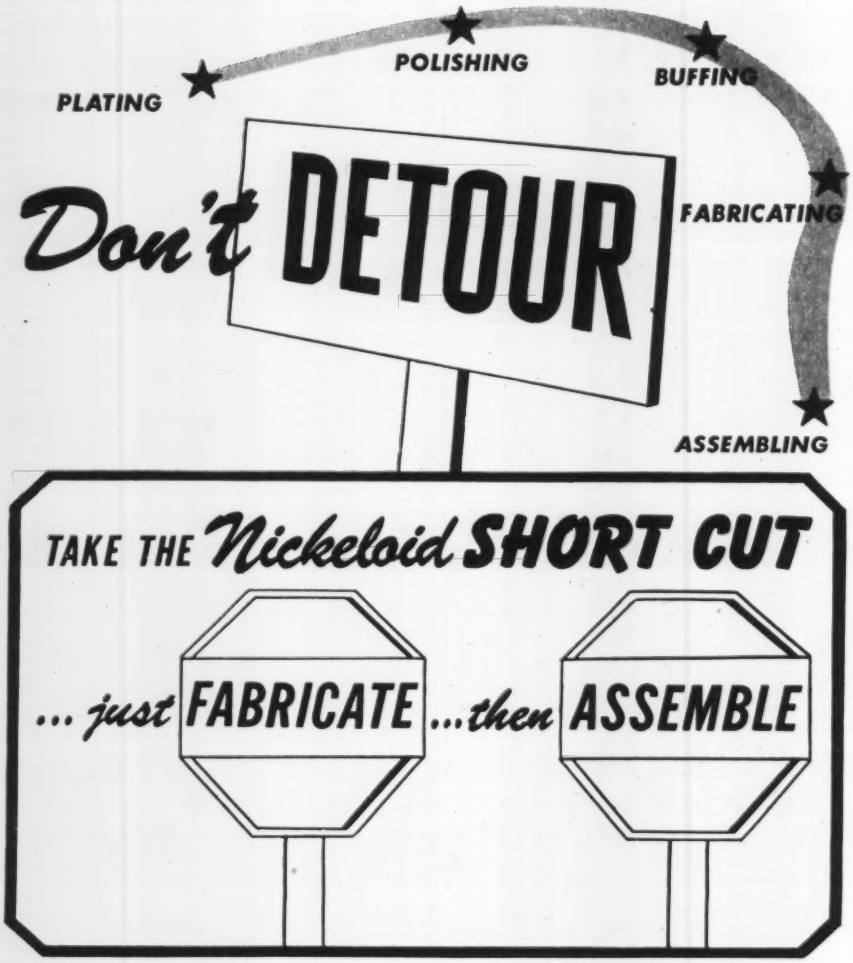

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NICKELOID Pre-finished METALS provide the shortest distance between raw material and finished product. You simply fabricate, then assemble. Product beauty goes up, production costs go down. Choose from sheets or coils in a wide range of gauges, and tempers, plated one or two sides, bright or satin finishes of Chromium, Nickel, Brass or Copper, plated to base metals such as Steel, Zinc, Brass, Copper or Aluminum.

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Electro-plated TO ALL COMMON *Base* METALS
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SHEETS AND COILS
OLDEST AND LARGEST PRODUCERS OF PRE-PLATED METALS

Established 1898
AMERICAN NICKELOID COMPANY
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much radiation, expressed in milliroentgens, the device has detected, and thus indicates the amount of radioactivity present in any area. A roentgen is the basic measuring unit of alpha, gamma, and beta rays, which may be produced by an x-ray machine, a piece of glass, or an atomic explosion. So sensitive is the instrument that it will detect the few harmless milliroentgens given off by a wristwatch dial.

Grinder Has 100 HP Motor

Thought to be the largest motor ever used in connection with a vertical spindle surface grinder is the 100 hp unit incorporated in the No. 400S machine made by Mattison Machine Works, Rockford, Ill. It was built for an automotive plant for reconditioning large dies, the huge motor providing for quick stock removal.

CALENDAR OF MEETINGS

† Denotes first listing in this column.

Nov. 14-16, American Institute of Electrical Engineers: Machine tool conference, Sheraton Hotel, Worcester, Mass. AIEE address: 33 W. 39th St., New York 18.

Nov. 15, National Welding Supply Association: West central zone meeting, Hotel Kirkwood, Des Moines, Iowa. Association address is 505 Arch St., Philadelphia 6.

Nov. 16-17, American Zinc Institute: Galvanizers committee meeting, Tutwiler Hotel, Birmingham, Ala. Address of institute is 60 E. 42nd St., New York 17.

Nov. 17, Illinois Mining Institute: 58th annual meeting, Hotel Abraham Lincoln, Springfield, Ill. Institute is located at 28 E. Jackson Blvd., Chicago 4.

Nov. 27-29, American Standards Association: National standardization conference, Waldorf-Astoria Hotel, New York. Association may be reached at 70 E. 45th St., New York 17.

Nov. 27-Dec. 2, American Society of Mechanical Engineers: 19th National Exposition of Power and Mechanical Engineering and annual meeting, Grand Central Palace, New York. Exposition headquarters: Grand Central Palace, New York 17.

Dec. 1, American Iron & Steel Institute, regional technical meeting, Drake Hotel, Chicago. AISI headquarters: 350 Fifth Ave., New York 1.

Dec. 4-6, Electric Industrial Truck Association: Meeting, Hotel McAlpin, New York. EITA is located at 3701 N. Broad St., Philadelphia.

Dec. 5, National Welding Supply Association: Southeastern zone meeting, Hotel Texas, Fort Worth, Tex. Address of association is 505 Arch St., Philadelphia 6.

Dec. 7-9, Electric Furnace Steel Committee, AIME: 8th annual meeting, William Penn Hotel, Pittsburgh. AIME headquarters: 29 W. 39th St., New York 18.

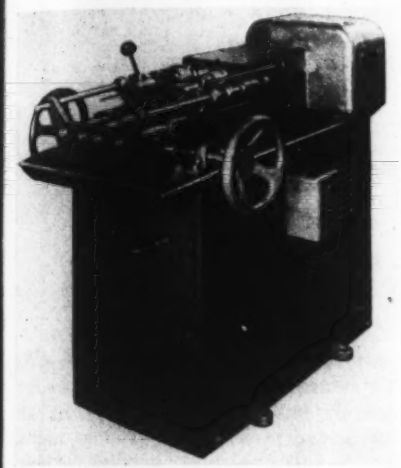
Dec. 13-14, Power Crane and Shovel Association: Meeting, Edgewater Beach Hotel, Chicago. Association address is 74 Trinity Place, New York 6.

Dec. 14, Cutting Tool Manufacturers Association: Meeting, Recess Club, Detroit. 416 Penobscot Bldg., Detroit 26, is association address.

New Products and Equipment

Two-Spindle Bolt Threader

Designed for the rapid threading of screw blanks and other milled, upset or forged parts having regular or irregular heads is the 2-spindle bolt threader made by Kent Machine Co., Cuyahoga Falls, O. Right or left hand threads can be cut by reversing the



motor. Changeover to another job is rapid. The longest line which may be threaded is 24 inches and longest thread cut is 6 inches. Threading capacity with straight threads is 1 inch in diameter, and with pipe threads, ¾-inch taper pipe.

Parallel to the threading spindles are two antifriction slides carrying work holders suiting work being threaded. Ball bushings are used in the slides. Blanks are placed in work holders and advanced to the dies by handwheels. When the die begins to cut, forward pressure on the wheel is removed and the work advances by lead of the thread itself. When the proper thread length is cut, an adjustable stop engages a fork fitted into the spool of the die and trips it automatically.

Check No. 1 on Reply Card for more Details

Grinder Line Extended

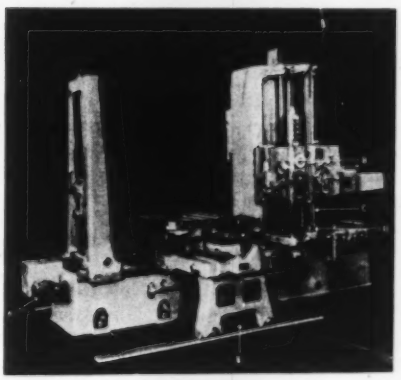
Cincinnati Grinders Inc., Marburg Ave., Cincinnati 9, O., has expanded its line of grinding machines to include 16-inch heavy duty and 20 and 24-inch plain grinders and 16, 20 and 24-inch roll grinders. Grinding wheel spindle bearings are of the Filmatic type which allows segments to rock slightly in the housing, thereby admitting wedge-shaped films between them and the spindle journal as rotation occurs. A direct current motor controlled electronically from an alternating current source drives the table through rack and pinion and provides dial selection of an infinite number of traverse rates from 3 to 120 inches per minute.

Headstock is a dead spindle direct motor driven unit, having a speed range from 20 to 72 rpm for the 16-inch size and 15 to 54 rpm for the 20 and 24-inch sizes. Wide selection of extra equipment is available for these machines, including automatic wheel balancing and hydraulic profile wheel truing equipment. Plain machines are built in seven lengths at 2 foot intervals from 48 to 192 inches, while the roll grinder style is built in the same lengths up to 168 inches.

Check No. 2 on Reply Card for more Details

Manual Machine Setting Ended

An electrically-operated positioning device announced by Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., makes possible automatic machine settings within 0.0002 to 0.0005-inch. Horizontal boring ma-



chine table and headstock fine feed movements to predetermined settings are mechanically controlled without time-consuming final hand adjustments.

Designed as a standard accessory for table type machines, the unit is equipped with saddle supports and auxiliary runways. It is equally efficient for use on a single workpiece requiring a series of bores, or on a number of parts produced in job lots. Device consists of two complete control units, one for the lateral setting of the table on the saddle and the other for the vertical setting of the headstock on the machine column. They may be operated individually or simultaneously.

Check No. 3 on Reply Card for more Details

Remote Hydraulic Ram

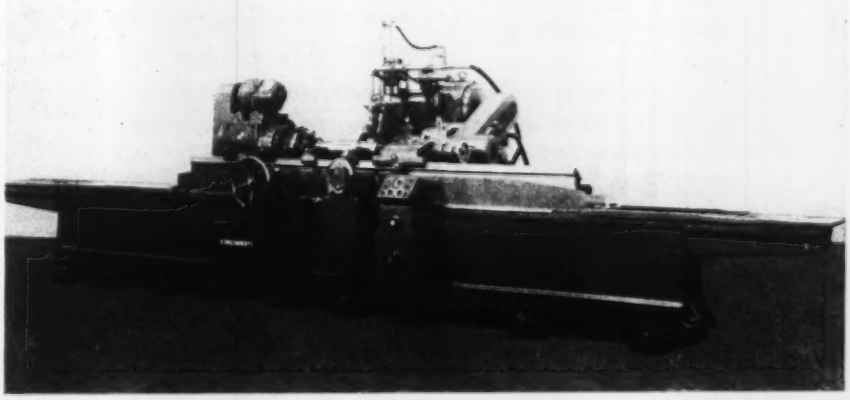
Templeton, Kenly & Co., Chicago, Ill., is producing a line of remote control hydraulic rams and pumps for operation where limited space or other difficulties make the use of self-contained equipment impossible. The Re-Mo-Trol units enable the operator to lift, pull or push from a distance and in any direction—up, down, sideways or at an angle.

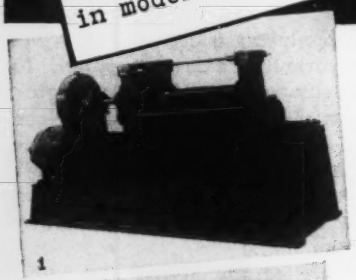
Feature of the 30-ton and higher capacity unit is the center hole tubular ram which enables use as a puller. A rod or bolt inserted through the ram and secured over the ram head can be pulled through the ram as it extends. This also simplifies rigging requirements on many jobs. Rams are available in seven models, including a telescoping ram, ranging from 10 to 100-ton capacity. Pumps operate at a maximum of 10,000 psi.

Check No. 4 on Reply Card for more Details

Strapping Band Dispenser

Holding and cutting to length one or two coils of Unit-Load strapping band are stationary and portable model dispensers, offered by Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill. Bands are cut in a single





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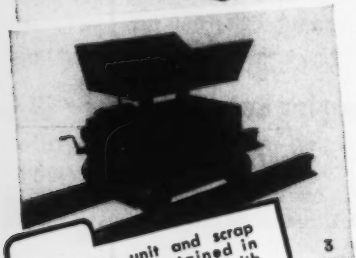

3

1: Slitting unit and scrap cutter, self-contained in welded steel base, with tilting entry guide.
2: Winder with variable speed transmission and power stripper.
3: Discharge buggy with motor-operated elevator.

3 GANG SLITTING LINES Increase Production in the Detroit Branch of AMERICAN BRASS COMPANY

Three identical, high-speed slitting lines designed for light gauges, have been installed to replace old equipment in American Brass Company's Detroit branch. This heavy duty machinery combines famous Torrington standards — advanced design, dependable accuracy and the ability to withstand abuse under continuous heavy service. This machine combines slitting unit and scrap cutter, winder and discharge buggy. Outstanding features are:

- Speed adjustable from 335 to 1005 feet per minute
- Anti-friction bearings
- Tilting entry guide for complete access to front of slitter in setting up
- Rotary head on blocks scrap cutter
- Arranged for winding metal on various diameter mandrels
- Variable speed transmission in winder to accommodate different winding diameters
- Adjustable tension on metal being wound
- Air-operated stripper to remove finished coils
- Motor-operated elevator on discharge buggy

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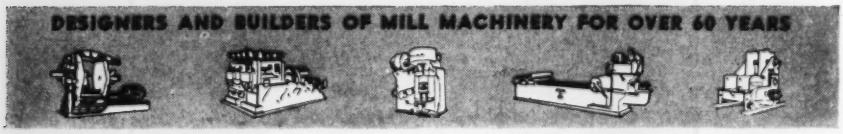
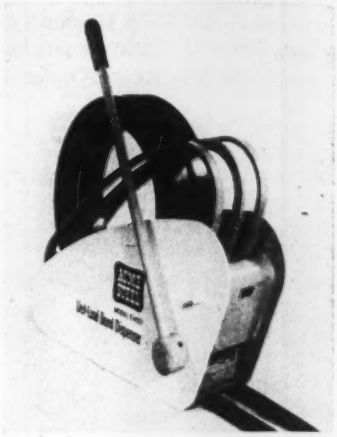
DESIGNERS AND BUILDERS OF MILL MACHINERY FOR OVER 60 YEARS



downstroke of the 30-inch hand lever. Over-running is minimized by V-belt controlled feed. Shear mechanism features tool steel blades, accessible for service or replacement.

Any two-coil combination of ¾, 1¼ or 2-inch band in all thicknesses may be handled by the dispenser. Outer bars adjust to band width,

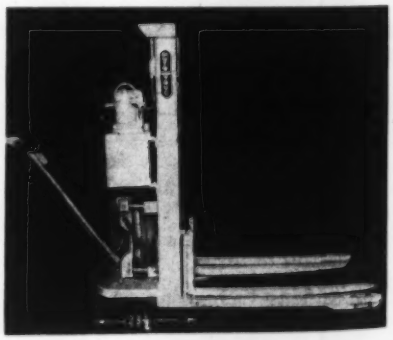


while center separator bar and slide plates are stationary. Separators for ⅜-inch band are obtainable at an extra charge. Portable model has a towing handle and hooded rubber casters. A positioning brake prevents crawling. Compartments are built in for tools and accessories.

Check No. 5 on Reply Card for more Details

Shorter Skid Handling Truck

Moto-Truc Co., 1953 E. 59th St., Cleveland 3, O., is introducing the Shortie Hi-Lift pallet and skid handling truck, 10 inches shorter than preceding models and 23½ inches from



front of truck to the face of lifting forks. Shortness has been accomplished by mounting battery above motor drive unit. Two coil springs, one on each side of the motor drive unit, hold the drive wheel firmly on the floor for maximum wheel traction. Swivel casters on the front provide a four-point load support.

Standard capacities are 3000 and 4000 pounds for fork lengths from 36 to 48 inches. Lifting heights are

ROCKRITE TUBING

Has High Surface Finish

BEFORE MACHINING!

PROVED BY PROFILOMETER RATINGS AS LOW AS 5 MICROINCHES

You can trim machining costs of ring shaped and cylindrical parts with Rockrite Tubing because it reaches your plant with close tolerances and smooth surfaces. The reason? This tubing is sized by a distinctively different process:

- **Dies compress the metal against a mandrel, tending to iron out small irregularities on both the inside and outside surfaces. The metal flows from high spots in the same manner as when it is forged.**
- **A certain amount of planishing action also takes place on the inside surface of the tube as it elongates under the pressure of the dies and creeps forward while in contact with the mandrel.**
- **In no part of this operation is there any action which can produce longitudinal scratches. The metal is not drawn through a die and over a mandrel.**

The proof of high surface finish? Profilometer readings recently taken on samples of Rockrite Tubing exhibiting superior finish show a range of RMS values of 5 to 55 microinches. In the manufacture of parts such as hydraulic cylinders this superior finish means substantial cost-savings well worth investigating.

HOW DO YOU SCORE? Do you know the three requirements essential for tube accuracy and lower-cost machined parts? New bulletin tells answers . . . gives more facts and figures on close-tolerance Rockrite Tubing. Send for your copy today.

ROCKRITE saves more than any other tubing

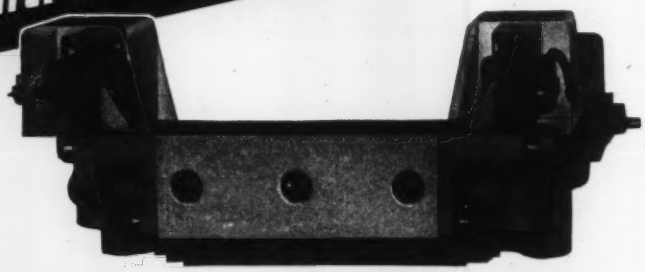
- **Higher cutting speeds**
- **Tools last longer between grinds**
- **Work-surface finishes are better**
- **Machined parts have closer tolerances**
- **Stations on automatics are often released for additional operations**
- **Extra-long pieces available—less downtime for magazine stocking and fewer scrap ends**
- **Closer tolerances often eliminate necessity for machining on outside or inside**

TR-119

ROCKRITE TUBING

TUBE REDUCING CORPORATION · WALLINGTON, NEW JERSEY

Specify Quick-As-Wink AIR AND HYDRAULIC Control Valves



their reduced amperage requirement SIMPLIFIES electrical circuits

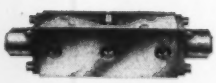
● Fast acting and dependable, Quick-As-Wink Control Valves are the proven, time tested answer to efficient — and safe — machine operation. Their short stroke simplifies electrical circuits and avoids destructive impact, minimizing wear and maintenance. They give users millions of cycles of trouble-free, high cycle service. 3/8" to 2" sizes. 2, 3 or 4-way actions. Bucking cylinder or solenoid return. Also available in neutral position types.

There's a Quick-As-Wink Valve for *every* machine control requirement. Send for the data sheets. Get full details today!

Individual DATA SHEETS for Each Valve — give complete details. Write today!

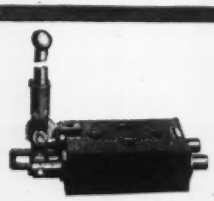
Hand Operated Air Valves—wide variety of uses. 2-way, 3-way, 4-way neutral position and compound exhaust.

Foot Operated Air Valves—workman has both hands free, speeding production. 2-way, 3-way and 4-way actions.

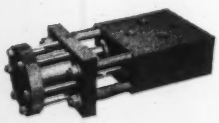


Single Plunger Valves—for air or low pressure hydraulic service. Lever, pilot, cam, diaphragm or solenoid operated. 2-way, 3-way, 4-way actions.

Series "O" and "OE" Valves—for air or hydraulic service up to 125 PSI. Push-pull, cam, pilot, diaphragm and solenoid operated. 1/8" and 1/4" pipe connections. 2-way, 3-way, 4-way and 5-way actions.



Hydraulic Valves—Up to 5000 PSI. Conservatively rated. 1/2", 3/4", 1" and 1 1/2" sizes. 2-way, 3-way, 4-way actions.



Hydraulic Valves—Up to 5000 PSI. Pilot cylinder operated. 1/2", 3/4", 1", 1 1/2" 2", 2 1/2" 3" and 4" sizes 2-way, 3-way, 4-way actions.

Quick-As-Wink Control Valves

THE HIGHER THE PRESSURE THE TIGHTER THE SEAL

Manufactured by **C. B. HUNT & SON, Inc.**

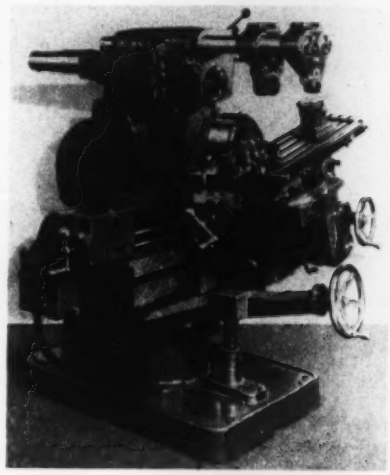
1925 East Pershing Street, Salem, Ohio

80, 94, 100, 110 and 120 inches. All controls are within fingertip reach of the operator. Travel speed is 2½ mph with load and 3 mph empty. An internal expanding shoe type brake acts directly on a drum bolted to the hub of the drive wheel.

Check No. 6 on Reply Card for more Details

Tool Room, Laboratory Milling

Possessing fundamental movements and adjustments common to the universal milling machine is the number 0 Omniversal machine produced by Brown & Sharpe Mfg. Co., Providence 1, R. I. Designed for tool room and experimental laboratory milling, machine also has an angular adjustment of the table in a vertical plane at right angles to the spindle and a horizontal feed of the entire knee assembly in the same plane.



Gear driven milling head is adjustable parallel to the overarms, and is arranged for universal angular adjustment. It has a 2-inch hand feed of the spindle and may be used independently or in conjunction with the machine spindle.

Eighteen spindle speeds from 40 to 1530 rpm for the machine and 76 to 2900 rpm for the Omniversal head are provided. An infinite number of feed changes from ½ to 15 inches per minute meet a wide variety of milling requirements.

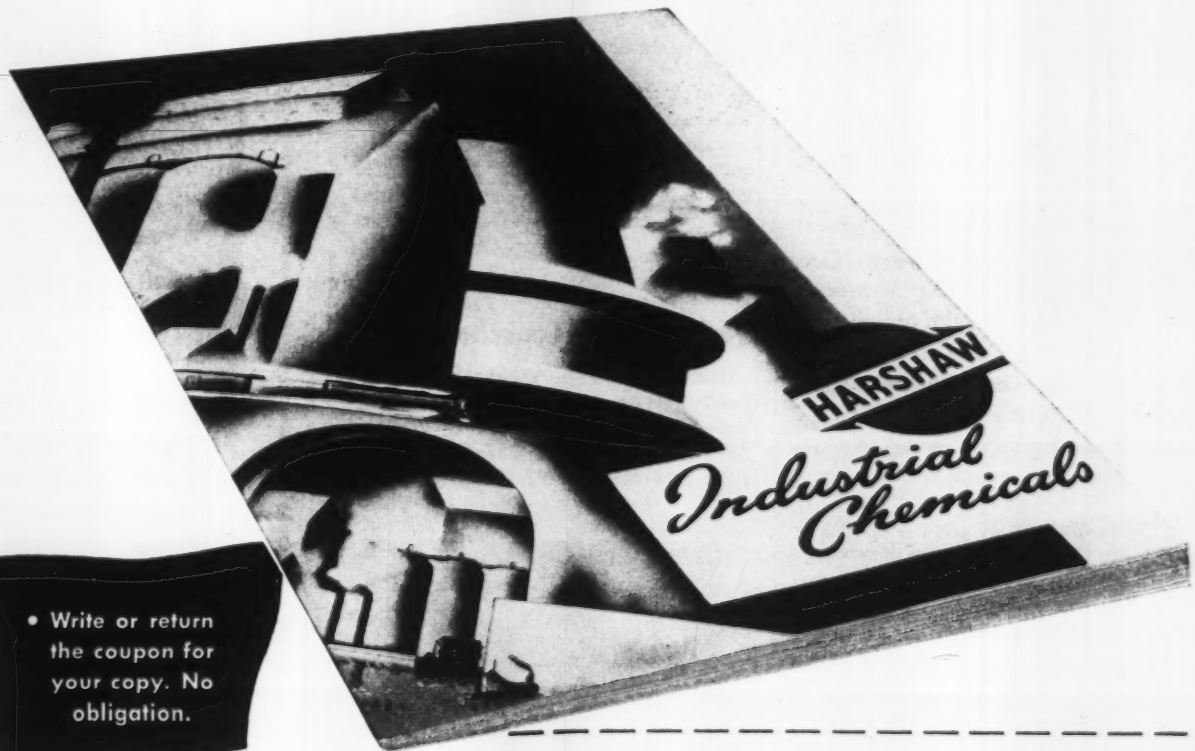
Check No. 7 on Reply Card for more Details

Powder Metal Press Simplified

F. J. Stokes Machine Co., 5900 Tabor Rd., Philadelphia 20, Pa., is offering the S-5 40-ton cam-operated powder metal press for production of various types of parts, cemented carbides, porous bearings, etc. Design largely eliminates necessity for changing cam inserts. Single handwheel sets machine for proper compression level of the lower punch, automatical-

send for your Free copy today!

● This booklet lists and describes Industrial Chemicals supplied by Harshaw. Electroplating salts, anodes and processes . . . driers and metal soaps . . . ceramic opacifiers, and colors . . . fluorides . . . glycerine . . . preformed catalysts and catalytic chemicals for petroleum and other organic processes . . . synthetic optical crystals . . . agricultural chemicals . . . fungicides and hundreds of chemical commodities. You can have a copy for the asking.



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Geared

TO TODAY'S CONDITIONS

Once again the Nation is confronted with an almost war-time emergency. Once again metals are difficult to procure. Here at Levinson our entire organization has already been geared to meet today's new problems. Conditions may have changed but Levinson's policy of close customer cooperation never changes. *This means . . .*

1. We will use every means at our command to try to supply our customers, even on a limited basis.
2. We will spare no effort to help you work out any of your problems in connection with the economical use of metals.
3. We will never deviate from our long established policy of never charging a premium for anything—*regardless of conditions.*

LSS-7

Levinson

STEEL SALES CO.

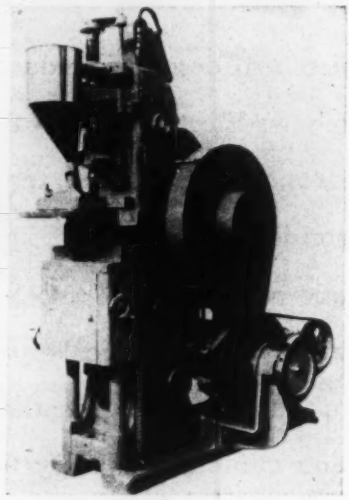
20TH AND WHARTON-STS., S. S.

PITTSBURGH, PA.

Warehouse Aluminum & Steel Products

ly takes care of the ejection level.

The lower plunger spring pulldown eliminates tendency for lower punch to hang in the die. In the upper punch a clamp ring is used to obtain better alignment. Pushbutton stations mounted in a convenient location have stop, start jog forward and re-

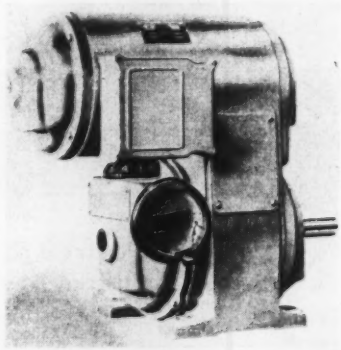


verse controls and a magnetic contactor to control the main motor. An agitated feed shoe can be furnished to speed up production of pieces having deep thin sections that are difficult to fill. Press may be used for sizing or coining as well as for forming through the use of a special attachment.

Check No. 8 on Reply Card for more Details

Variable Speed Capacitor Motors

Now offered in single phase capacitor type design are ½ to 3 hp Speed-Trol electric power drives announced by Sterling Electric Motors Inc., Los Angeles 22, Calif. Provid-



ing infinite speed variation in practically any given range that might be desired, the units are available in either 2:1, 3:1 or 4:1 speed variations and have 18 different maximum speeds from 2000 down to 52 rpm.

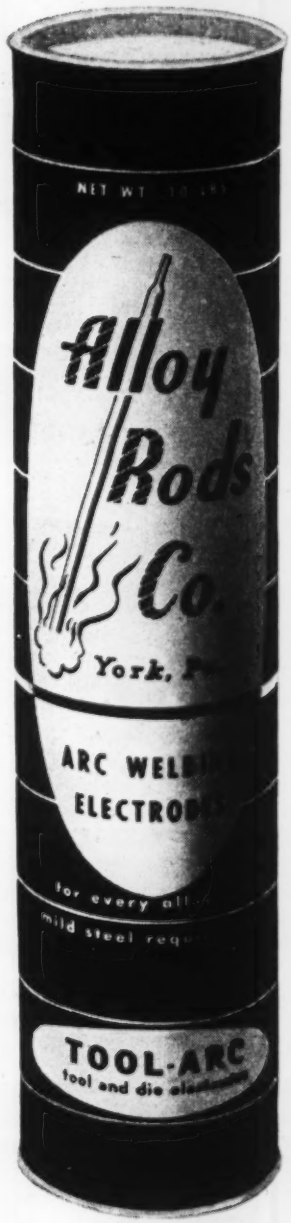
Any selected speed is steady and will not vary under fluctuating load

The Quality Line

IN THE

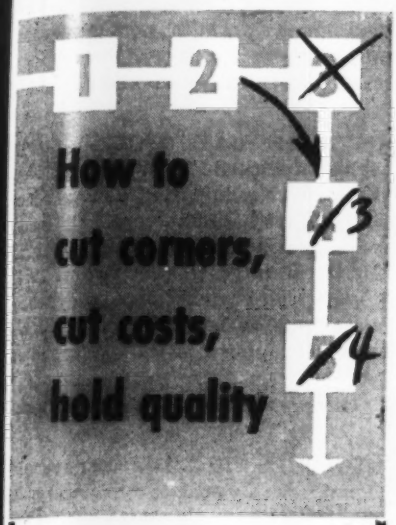
STEEL CONTAINER

Moisture, dirt and grease proof . . . Easy to stock convenient 10 lb. size.



TOOL-ARC TOOL AND DIE ELECTRODES

TOOL-ARC saves you money repairing or reclaiming expensive tools and dies . . . saves production delays too. Here's a complete line of electrodes for welding each of the 6 basic types of tool and die steels. Recommended procedures and heat treatments are described in Bulletin No. 2519. Alloy Rods Company, 5611 W. Market Street, York, Penna.



OAKITE metal-cleaning procedures can make an entire production operation easier, cheaper, quicker. Three examples:

1. Pre-Paint Treatment Saves $800 Monthly That's what an electrical manufacturer credits to the OAKITE CrysCoat PROCESS, which cleans and phosphates simultaneously.

2. New Brass Cleaner Makes Big Savings A large plating job shop cleans brass with a new Oakite formula that minimizes tarnishing and rejects; cleans so well that, in many cases, a copper strike is dropped from the plating cycle.

3. Eliminates Pickle A maker of radio transmitters (using Oakite Compound No. 33 to remove rust and oil at same time) reports: "No longer necessary to pickle the steel."

FREE Write Oakite Products, Inc., 34E Thames St., New York 6, N. Y., for the new 44-page booklet *"Some good things to know about Metal Cleaning"*. Among the subjects are:

Machine cleaning	**Tank cleaning**
Electrocleaning	**Pickling**
Pre-paint treatment	**Barrel cleaning**
Paint stripping	**Burnishing**
Steam-gun cleaning	**Rust prevention**

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in Principal Cities of United States and Canada

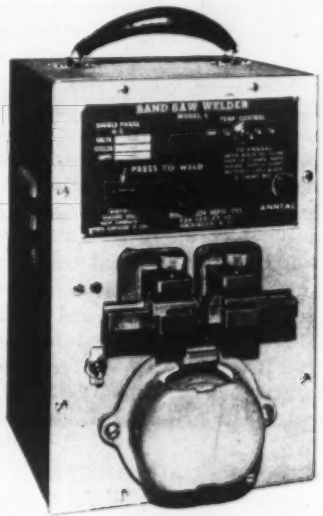
conditions. Other features include fingertip speed control, one piece cast iron drip-proof frame, "herringbone" rotor, vinol-acetal insulated wire stator windings, and standard NEMA mounting dimensions.

Check No. 9 on Reply Card for more Details

Welds Band Saw Blades

Capable of welding 0.050-inch diameter contour-cutting band saw blade, as well as all types of blades up to ½-inch flat is a welder designed by Brennen Mfg. Co., 228 Seeley St., Brooklyn, N. Y. Because of its wide range it is useful on internal tool and die work.

Welder is fully automatic. There are no tension adjustments. Simplified controls assure uniform results at all times. A built-in grinder removes flash from the weld. A gage is provided for checking thickness of weld on flat saws. Welding jaws are constructed of solid copper and unit is housed in a welded steel case.

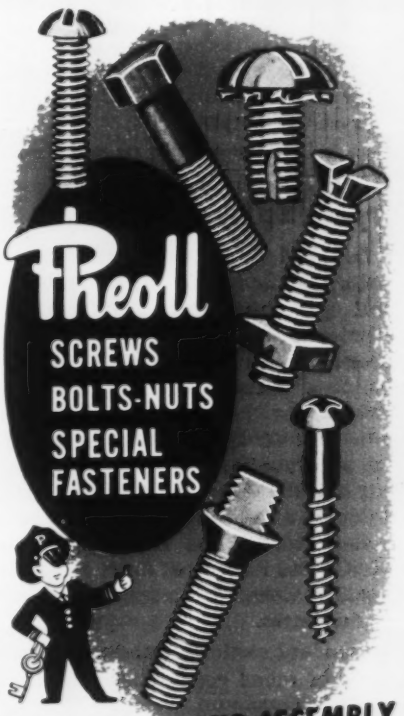


Check No. 10 on Reply Card for more Details

Tube Rolling Control

Adaptable for the rolling of both ferrous and nonferrous tubing is an electrically operated tube rolling control made by Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill. A precision instrument designed for heavy service, the John Crane control has only two electrical working parts that are shock-proof mounted and enclosed. The entire unit is light in weight.

Dial settings on the control panel are calibrated over a wide range of sizes and gages in both ferrous and nonferrous tubing. The expanding gun is plugged into the control unit, the dial setting for the desired size and gage of tube is made. Slight



WILL KEEP YOUR ASSEMBLY LINES AT PEAK CAPACITY

Whatever you manufacture or assemble, you can speed production and improve your product by using Pheoll screws, bolts and nuts. These industrial fasteners drive easy and straight, and will not bind because threads are accurately rolled or machined. Precision-made screw and bolt heads, slots and head recesses prevent wrench and driver slippage. Count, too, the added bonus you receive by using fasteners that improve product appearance.

An interesting story on standard and special industrial fasteners and their profitable applications to your needs may be obtained from experienced Pheoll engineers. Ask these men to recommend screws, bolts and nuts that will increase your overall profits on assembly line work.

these Pheoll products prevent production lag

Tapping Screws • Cap Screws • Sems • Phillips Recessed Head Screws and Bolts • Machine Screws • Special Fasteners • Thread Cutting Screws

Pheoll
MANUFACTURING COMPANY
5700 ROOSEVELT ROAD
CHICAGO 50, ILLINOIS
SCREWS • BOLTS • NUTS
Industrial Fasteners and Holding Devices

pressure on the handle of the gun engages a control in the circuit, and as soon as the tube is rolled to exactly the proper diameter the control cuts off the motor.

Check No. 11 on Reply Card for more Details

Dry Cooling Equipment

Designed for cooling engine jacket water, but adaptable for cooling natural gas, lubricating oils, chemical solutions, etc., is a line of three Dri-Cooler models announced by Marley Co. Inc., Kansas City 15, Kan. The smaller, or portable units, are of forced draft type, with one having fan and tube sections mounted vertically and the other horizontally. Seven different sizes are available in each model. Third model is larger in capacity, also has forced draft and horizontally mounted section. It is made in four sizes.

Standard sections of these units are made of round copper tube pressure-bonded aluminum or copper fins, brazed into formed steel pipe headers. All are designed to operate up to 150 psi at 300°F. Cast aluminum alloy fans are used with a V-belt drive. Fan shafts move on grease-packed bearings in an enclosed bearing housing.

Check No. 12 on Reply Card for more Details

• • •

CLEATS HOLD PALLETS: An oblique corner spur on Peyton spur cleats, made by National Dunnage Co., Dallas, Tex., drives deeper into car siding or floor as more pressure is applied. Made in various sizes, the cleats will hold pallets, gates and cross bar members in place to reduce freight damage in transit. Other uses include securing of loads shipped in barrels, bags, cases, etc. They also lend themselves to hold-downs over crates and top-heavy machinery.

Check No. 13 on Reply Card for more Details

WEATHERPROOF FLOODLIGHT: R-60 weatherproof floodlight lamps, introduced by Radiant Lamp Corp., Newark 8, N. J., are made of hard glass which resists sudden temperature changes, moisture, vibration and impact of flying insects. Bases are nickel plated to reduce corrosion and freezing in sockets.

Check No. 14 on Reply Card for more Details

SURFACE GRINDER: No. 24A2 two spindle automatic rotary surface grinder, is offered by Mattison Machine Works, Rockford, Ill., with a special fixture for grinding sides of connecting rods. Pieces are first rough ground by coarse grained wheel mounted on first spindle after which they are checked by an automatic sizer. Pieces then pass under a fine grained wheel mounted on second spindle for finish cut again being checked by sizer.

Check No. 15 on Reply Card for more Details

PHOTOMICROGRAPH CAMERAS: A new series of AO Spencer 35 mm and 4 x 5-inch photomicrographic cameras is announced by American Optical Co., Buffalo, N. Y. All have a revolving body feature which permits 360 degree rotation of camera backs. Three models are available.

Check No. 16 on Reply Card for more Details

BENDS TAGS: Model TO-1X tag bender, developed by M. E. Cunningham Co., Pittsburgh, Pa., bends tags so they fit over a hammer with a nail in position for driving into the billet. This identification system is used on first and last billet of each heat as it enters the preparation furnace.

Check No. 17 on Reply Card for more Details

NO SHADOWS: Dual spotlights eliminate shadows and over and under terminals brace tip and improve visibility in the new light duty soldering gun introduced by Weller Electric Corp., Easton, Pa.

Check No. 18 on Reply Card for more Details

IMPROVED TACHOMETER: O. Zernickow Co., New York 7, N. Y., offers an improved hand tachometer with a 3-inch dial, single spindle, quintuple selective range with rotating gear shift. It indicates without timing or calculating revolutions per minute or feet per minute speeds, speed fluctuations and belt slippage.

Check No. 19 on Reply Card for more Details

LOCKS CORD CAPS: A new, safe interlock receptacle, developed by Panellit Inc., Chicago 26, Ill., incorporates a positive, safety cam lever that locks cord caps securely in the receptacle. This makes it impossible to remove the cord while current is on. A flip of the lever breaks the circuit while allowing plugs to be removed from the sockets.

Check No. 20 on Reply Card for more Details

THERMOCOUPLE VACUUM GAGES: A redesigned line of thermocouple vacuum gages for industrial, laboratory and other applications where vacuum must be accurately measured is announced by General Electric's Meter and Instrument Divisions, Schenectady 5, N. Y. Included in the line are a 115 v, ac, portable thermocouple vacuum gage and types for both rack and panel mounting.

Check No. 21 on Reply Card for more Details

CATHODE RAY OSCILLOSCOPE: Sylvania Electric Products Inc., New York 19, N. Y., offers a new 7-inch cathode ray oscilloscope. It incorporates a multivibrator sweep circuit for linear internal sweep from 10 to 30,000 cycles which may be synchronized to 60 cycles, an external signal or signal applied to its vertical input terminal.

Check No. 22 on Reply Card for more Details

RESTORES THREADS: For reconditioning closely spaced studs and bolts that are battered, distorted or rusted, Buckingham Mfg. Co. Inc., Binghamton, N. Y., introduces a thread restorer. Adjustable cutting jaws can be fitted by a twist of the handle to any male thread of ¼ to 1-inch root diameter, either right or left hand.

Check No. 23 on Reply Card for more Details

AIR LINE FILTER: Air line filter No. 3084, available from A. Schrader's Son Division, Brooklyn 17, N. Y., features a filtering element composed of hundreds of laminations of a newly developed material. Filtering area is large enough to assure full air flow even after long periods of use. Filter is available in three standard pipe sizes, ¼, ⅜ and ½-inch.

Check No. 24 on Reply Card for more Details

CURVES WITH COUPLINGS: Combination stud and hook couplings on 45 and 90 degree gravity wheel conveyor curves made by Sage Equipment Co., Buffalo 13, N. Y., make it possible to attach curves for either right or left turns regardless of coupling on end of straight section.

Check No. 25 on Reply Card for more Details

AIR CONTROL VALVE: An air control valve with a die cast body is available from Valvair Corp., Akron 11, O. Body is shock resisting, high tensile zinc alloy. Valves are for air, water or oil service and withstand pressures up to 175 psi and temperatures up to 125° F. They are available in ¼ and ⅜-inch pipe sizes.

Check No. 26 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

JANUARY steel mill rolling schedules are being set up but they hold little cheer for manufacturers of civilian goods. Supply conditions promise to steadily deteriorate under impact of defense and related demands from here on. Little new unrated tonnage is being scheduled for January rolling. Defense and related requirements, plus heavy order carryover from fourth quarter, will just about absorb the entire month's production of all major products. This spells more supply difficulties ahead, though it is not clear just how severely regular customers' shipments will be cut down since the bulk of steel produced will continue to move on civilian account.

SCHEDULES— Except for some last minute adjustments, January mill order books are just about closed, leadtime on defense orders for the month expiring Nov. 15. Tonnage coming in from two government agencies just given DO ratings will have to be accommodated, as will allotments for warehouses ordered last week by the National Production Authority. The warehouse allotments, designed to assure small small manufacturers a continuing source of steel supply, take precedence after defense needs.

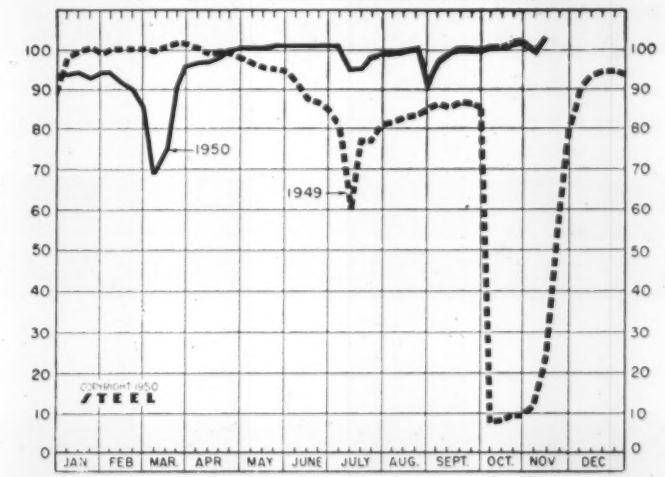
SUPPLIES— Since the steelmakers are compelled to accept defense orders only up to a certain percentage of their output of the separate products, civilian requirements will continue to get most of the steel produced. Demand on civilian account, however, is far in excess of the surplus over defense and other emergency needs, and unless credit and other government curbs force cutbacks in civilian goods demands soon, already acute steel shortage conditions will intensify noticeably. Procurement difficulties of consumers over past months, and high-level manufacturing schedules, have prevented the accumulation of substantial consumer inventories. Most metalworking shops have been operating on a precarious supply basis for some time past. With defense and other emergency needs taking an increasingly larger slice of production the scramble for tonnage promises to become even more hectic than it has been in recent months. Only limited supply relief is possible from the premium conversion and gray markets, and while more foreign steel is coming in, the tonnage is only a drop-in-the-bucket.

PRODUCTION— The steel mills last week pushed production to the highest level ever attained in history, the estimated national ingot rate jumping 4.5 points to 103 per cent of capacity. This is equivalent to output of about 1,986,600 net tons of steel. The increase in activity over the preceding week was due almost entirely to settlement of the wildcat strike at Bethlehem Steel's Lackawanna mill.

PRICES— Stability marked the steel markets last week. However, isolated changes continued to be made. U. S. Steel subsidiaries raised pig iron prices $3 per ton and upward adjustments were effected on ferromanganese and ferrosilicon. All signs point to major upward revisions in steel prices once current wage negotiations are out of the way. Last week it was thought that talk of possible early application of price controls by Washington may hurry up the determination of steel wage and price policies. Last week, progress was reported being made on the wage study but there was no sign a settlement was imminent. Guesses in the trade are that steel prices, on the average, are due for a rise of $5 to $8 per ton.

COMPOSITES— STEEL's weighted index on finished steel held unchanged at 157.76 last week, as did the arithmetical price average at $95.09. Steelmaking scrap composite also was unchanged for the third consecutive week at $41.67. Upward revision by U. S. Steel lifted pig iron composites, with basic now $49.04, No. 2 foundry, $49.54, and malleable $50.27.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Nov. 11	Change	Same Week 1949	Same Week 1948
Pittsburgh	104	0	2	97
Chicago	105	— 1*	6	99
Eastern Pa.	100	0	65	95
Youngstown	104	— 2	5	105
Wheeling	98.5	+ 0.5	60	92.5
Cleveland	97.5	0	14	96.5
Buffalo	104	+75	85	104
Birmingham	100	0	6	100
New England	90	— 1	58	90
Cincinnati	106	0	52	103
St. Louis	91.5	+ 3	91.5	82.5
Detroit	106	0	41	99
Western	103	+ 4	29.5	..
Estimated national rate	103	+ 4.5	24	99

Based on weekly steelmaking capacity of 1,906,267 net tons for first half and 1,926,803 second half, 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948. *Change from revised rate.

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Composite Market Averages

	Nov. 9 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	157.76	157.76	157.29	152.52	101.87
Index in cents per lb. ..	4.274	4.274	4.261	4.132	2.760
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$95.09	$95.09	$94.64	$91.64	$58.27
No. 2 Fdry, Pig Iron, GT	49.54	49.35	48.97	46.10	25.42
Basic Pig Iron, GT	49.04	48.28	47.72	45.60	24.75
Malleable Pig Iron, GT..	50.27	49.63	49.20	47.27	26.04
Steelmaking Scrap, GT..	41.67	41.67	41.00	28.00	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Nov. 9 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.45	3.45	3.45	3.35	2.25
Bars, H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, H.R., del. Philadelphia	3.93	3.93	3.93	3.83	2.57
Bars, C. F., Pittsburgh....	4.15	4.15	4.15	3.95-4.00	2.75
Shapes, Std., Pittsburgh ..	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Shapes, del. Philadelphia..	3.46	3.46	3.46	3.50	2.215
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa. ...	3.90	3.90	3.90	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.40	2.25
Plates, Claymont, Del. ...	3.90	3.90	3.90	3.50	2.25
Plates, del. Philadelphia ..	3.84	3.84	3.84	3.59	2.30
Sheets, H.R., Pittsburgh..	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh ..	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh ...	3.50-75	3.50-75	3.50	3.25	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh	4.15-85	4.15-85	4.15-50	4.00	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00-15	2.90
Strip, C.R., Detroit	4.35-5.10	4.35-5.10	4.35-95	4.20-25	2.90
Wire, Basic, Pittsburgh ...	4.50-75	4.50-75	4.50-75	4.15	2.75
Nails, Wire, Pittsburgh ...	5.30-60	5.30-60	5.30-60	5.15	2.90
Tin plate, box, Pittsburgh.	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Wire rods, 7/32-⅜", Pitts...	3.85	3.85	3.85	3.40	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$50.00	$47-$50	$47-$50	$47.00	$26.25
Basic, Valley	49.00	49.00	46-49	46.00	25.25
Basic, del. Phila.	53.39	53.39	50.39	49.44	27.09
No. 2 Fdry, Pitts.	49.50	49.50	49.50	46.50	25.75
No. 2 Fdry, Chicago	49.50	49.50	49.50	46.50	25.75
No. 2 Fdry, Valley	49.50	49.50	49.50	46.50	25.75
No. 2 Fdry, del. Phila. ...	53.89	53.89	50.89	49.94	27.59
No. 2 Fdry, Birm.	45.88	45.88	45.88	39.38	22.13
No. 2 Fdry (Birm.) del. Cin.	52.58	52.58	52.58	46.08	25.81
Malleable, Valley, ...	49.50	49.50	49.50	46.50	25.75
Malleable, Chicago.....	49.50	46.50-49.50	46.50-49.50	46.50	25.75
Charcoal, Lyles, Tenn. ...	62.00	62.00	62.00	60.00	33.00
Ferromanganese, Etna, Pa.	175.0	175.00	175.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts...	$44.00	$44.00	$44.00	$29.50	$20.00
No. 1 Heavy Melt. E. Pa..	41.00	41.00	39.00	25.00	18.75
No. 1 Heavy Melt. Chicago	40.00	40.00	40.00	29.50	18.75
No. 1 Heavy Melt. Valley.	43.75	43.75	43.75	32.75	20.00
No. 1 Heavy Melt. Cleve...	43.25	43.25	43.25	30.25	19.50
No. 1 Heavy Melt. Buffalo.	41.50	41.50	41.50	27.25	19.25
Rails, Rerolling, Chicago..	64.50	64.50	61.00	44.50	22.25
No. 1 Cast, Chicago.....	53.50	53.50	50.50	41.50	20.00

Coke, Net Ton

Beehive, Furn., Connlsvl...	$14.25	$14.25	$14.25	$13.25	$7.50
Beehive, Fdry., Connlsvl...	16.50	16.50	16.50	15.75	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.00	13.00

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	18.50	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	10.00	8.25
Lead, St. Louis	16.80	16.80	15.80	12.55	6.35
Tin, New York 140.00		131.00	109.25	94.50	52.00
Aluminum, del.	19.00	19.00	19.00	17.00	15.00
Antimony, Laredo, Tex. ..	32.00	32.00	32.00	32.00	14.50
Nickel, refinery, duty paid.	48.00	48.00	48.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$51.00	$51.50	$52.00	$52.50
Brooklyn, N.Y., del.	....	55.79	56.29	....
Newark, del.	53.63	54.13	54.63	55.13
Philadelphia, del.	53.39	53.89	54.39	54.89
Birmingham District				
AlabamaCity, Ala. R2	45.38	45.88	....	....
Birmingham R2	45.38	45.88	....	....
Birmingham S9	45.38	45.88	....	....
Woodward, Ala. W15	45.38	45.88	....	....
Cincinnati, del.	....	52.58	....	....
Buffalo District				
Buffalo H1, R2	49.00	49.50	50.00	....
Tonawanda, N.Y., W12	49.00	49.50	50.00	....
N. Tonawanda, N.Y., T9	....	49.50	50.00	....
Boston, del.	58.26	58.76	59.20	....
Rochester, N.Y., del.	51.63	52.13	52.63	....
Syracuse, N.Y., del.	52.58	53.08	53.58	....
Chicago District				
Chicago I-3	49.00	49.50	49.50	50.00
Gary, Ind. C3	*49.00*	....	*49.50*	....
IndianaHarbor, Ind. I-2	49.00	....	49.50	....
So. Chicago, Ill. W14	49.00	49.50	49.50	....
So. Chicago, Ill. Y1	49.00	49.50	49.50	....
So. Chicago, Ill. C3	*49.00*	....	*49.50*	*50.00*
Milwaukee, del.	*50.89*	*51.39*	*51.39*	*51.89*
Muskegon, Mich., del.	....	*54.98*	*54.98*	....
Cleveland District				
Cleveland A7	*49.00*	*49.50*	*49.50*	*50.00*
Cleveland R2	49.00	49.50	49.50	....
Akron, del. from Cleve.	*51.39*	*51.89*	*51.89*	*51.39*
Lorain, O. N3	*49.00*	....	....	*50.00*
Duluth I-3	....	....	49.50	....
Erie, Pa. I-3	49.00	49.50	49.50	50.00
Everett, Mass. E1	....	52.25	52.75	....
Fontana, Calif. K1	55.00	55.50	....	....
Geneva, Utah G1	*49.00*	*49.50*	....	....
Seattle, Tacoma, Wash., del.	....	*57.20*	....	....
Portland, Oreg., del.	....	*57.20*	....	....
Los Angeles, San Francisco, del.	*56.70*	*57.20*	....	....
GraniteCity, Ill. M10	50.90	51.40	51.90	....
St. Louis, del. (inc. tax)	51.65	52.15	52.65	....
Ironton, Utah C11	*49.00*	*49.50*	....	....
LoneStar, Tex. L6	45.00	*45.50	45.50	....
Minnequa, Colo. C10	49.00	49.50	50.00	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	49.50	49.50	50.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	50.69	50.69	51.19
McKeesRocks, del.	....	50.45	50.45	50.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	50.94	50.94	51.44
Verona, del.	....	51.40	51.40	51.90
Brackenridge, del.	....	51.63	51.63	52.13
Bessemer, Pa. C3	*49.00*	....	*49.50*	*50.00*
Clairton, Rankin, So. Duquesne, Pa. C3 ..	*49.00*	....	....	....
McKeesport, Pa. N3	*49.00*	....	....	*50.00*
Sharpsville, Pa. S6	....	....	49.50	50.00
Steelton, Pa. B2	51.00	51.50	52.00	52.50
Swedeland, Pa. A3	53.00	53.50	54.00	54.50
Toledo, O. I-3	49.00	49.50	49.50	50.00
Cincinnati, del.	54.01	54.51	....	....
Troy, N.Y., R2	51.00	51.50	52.00	52.50
Youngstown District				
Hubbard, O. Y1	49.00	49.50	49.50	....
Youngstown Y1	49.00	49.50	49.50	50.00
Mansfield, O., del.	53.26	53.76	53.76	54.26

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$59.50
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls, N.Y. P15	$78.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	82.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2...	86.00
Wenatchee, Wash., OH & Fdry., frt. allowed K2	82.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$62.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	*$54.00*
Steelton, Pa. B2	57.00
Philadelphia delivered	60.00
Troy, N.Y. R2	57.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL Nov. 9, 1950; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Fontana, Calif. K1 ..... 76.00
Munhall, Pa. C3 ..... 50.00

INGOTS, Alloy (NT)
Detroit R7 ..... $51.00
Fontana, Calif. K1 ..... 77.00
Houston, Tex. S5 ..... 59.00
Midland, Pa. C18 ..... 51.00
Munhall, Pa. C3 ..... 51.00
So. Duquesne, Pa. C3 ..... 51.00

BILLETS, BLOOMS & Slabs Carbon, Rerolling (NT)
Bessemer, Pa. C3 ..... $53.00
Clairton, Pa. C3 ..... 53.00
Conshohocken, Pa. A3 ..... 62.00
Ensley, Ala. T2 ..... 53.00
Fairfield, Ala T2 ..... 53.00
Fontana, Calif. K1 ..... 72.00
Gary, Ind. C3 ..... 53.00
Johnstown, Pa. B2 ..... 53.00
Lackawanna, N.Y. B2 ..... 53.00
Munhall, Pa. C3 ..... 53.00
So. Chicago, Ill. C3 ..... 53.00
So. Duquesne, Pa. C3 ..... 53.00

Carbon, Forging (NT)
Bessemer, Pa. C3 ..... $63.00
Buffalo R2 ..... 63.00
Canton, O. R2 ..... 63.00
Clairton, Pa. C3 ..... 63.00
Cleveland R2 ..... 63.00
Conshohocken, Pa. A3 ..... 68.00
Detroit R7 ..... 66.00
Ensley, Ala T2 ..... 63.00
Fairfield, Ala. T2 ..... 63.00
Fontana, Calif. K1 ..... 82.00
Gary, Ind. C3 ..... 63.00
Geneva, Utah G1 ..... 63.00
Houston, Tex. S5 ..... 71.00
Ind. Harbor, Ind. I-2 ..... 63.00
Johnstown, Pa. B2 ..... 63.00
Lackawanna, N.Y. B2 ..... 63.00
LosAngeles B3 ..... 82.00
Munhall, Pa. C3 ..... 63.00
Seattle B3 ..... 82.00
So. Chicago C3, R2, W14 ..... 63.00
So. Duquesne, Pa. C3 ..... 63.00
So. SanFrancisco B3 ..... 82.00

Alloy (NT)
Bethlehem, Pa. B2 ..... $66.00
Buffalo R2 ..... 66.00
Canton, O. R2, T7 ..... 66.00
Conshohocken, Pa. A3 ..... 70.00
Detroit R7 ..... 66.00
Fontana, Calif. K1 ..... 85.00
Gary, Ind. C3 ..... 66.00
Houston, Tex. S5 ..... 74.00
Ind. Harbor, Ind. Y1 ..... 66.00
Johnstown, Pa. B2 ..... 66.00
Lackawanna, N.Y. B2 ..... 66.00
LosAngeles B3 ..... 86.00
Massillon, O. R2 ..... 66.00
Midland, Pa. C18 ..... 66.00
Munhall, Pa. C3 ..... 66.00
So. Chicago C3, R2, W14 ..... 66.00
So. Duquesne, Pa. C3 ..... 66.00
Warren, O. C17 ..... 66.00
Youngstown Y1 ..... 66.00

ROUNDS, SEAMLESS TUBE (NT)
Canton, O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Fontana, Calif. K1 ..... 100.00
Gary, Ind. C3 ..... 76.00
Ind. Harbor, Ind. I-2 ..... 76.00
Massillon, O. R2 ..... 76.00
So. Chicago, Ill. R2 ..... 76.00
So. Duquesne, Pa. C3 ..... 76.00

SHEET BARS (NT)
Fontana, Calf. K1 ..... $86.00

SKELP
Aliquippa, Pa. J5 ..... 3.25
Munhall, Pa. C3 ..... 3.15
Warren, O. R2 ..... 3.15
Youngstown C3, R2 ..... 3.15

WIRE RODS
AlabamaCity, Ala. R2 ..... 3.85
Buffalo W12 ..... 3.85
Cleveland A7 ..... 3.85
Donora, Pa. A7 ..... 3.85
Fairfield, Ala. T2 ..... 3.85
Fontana, Calif. K1 ..... 4.60
Houston, Tex. S5 ..... 4.25
Ind. Harbor, Ind. Y1 ..... 3.85
Johnstown, Pa. B2 ..... 3.85
Joliet, Ill. A7 ..... 3.85
LosAngeles B3 ..... 4.65
Minnequa, Colo. C10 ..... 4.10
Monessen, Pa. P7 ..... 4.05
No. Tonawanda, N.Y. B11 ..... 3.85
Pittsburg, Calif. C11 ..... 4.50
Portsmouth, O. P12 ..... 3.85
Roebling, N.J. R5 ..... 3.95
So. Chicago, Ill. R2 ..... 3.85
SparrowsPoint, Md. B2 ..... 3.95
Sterling, Ill. (1) N15 ..... 4.10
Struthers, O. Y1 ..... 3.85
Torrance, Calif. C11 ..... 4.65
Worcester A7 ..... 4.15

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity, Ala. R2 ..... 3.40
Aliquippa, Pa. J5 ..... 3.40
Bessemer, Ala. T2 ..... 3.40
Bethlehem, Pa. B2 ..... 3.45
Clairton, Pa. C3 ..... 3.40
Fairfield, Ala. T2 ..... 3.40
Fontana, Calif. K1 ..... 4.00
Gary, Ind. C3 ..... 3.40
Geneva, Utah G1 ..... 3.40
Houston, Tex. S5 ..... 3.80
Ind. Harbor, Ind. I-2 ..... 3.40
Johnstown, Pa. B2 ..... 3.45
KansasCity, Mo. S5 ..... 4.00
Lackawanna, N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.00
Minnequa, Colo. C10 ..... 3.85
Munhall, Pa. C3 ..... 3.40
Niles, Calif. (22) P1 ..... 4.02
Phoenixville, Pa. P4 ..... 4.25
Portland Oreg. O4 ..... 4.25
Seattle B3 ..... 4.05
So. Chicago, Ill. C3, W14 ..... 3.40
So. SanFrancisco B3 ..... 3.95
Torrance, Calif. C11 ..... 4.00
Weirton, W. Va. W6 ..... 3.40

Alloy Stand. Shapes
Clairton, Pa. C3 ..... 4.05
Fontana, Calif. K1 ..... 5.25
Munhall, Pa. C3 ..... 4.05
So. Chicago, Ill. C3 ..... 4.05

H.S., L.A. Stand. Shapes
Aliquippa, Pa. J5 ..... 5.15
Bessemer, Ala. T2 ..... 5.15
Bethlehem, Pa. (14) B2 ..... 5.20
Clairton, Pa. C3 ..... 5.15
Fairfield, Ala. T2 ..... 5.15
Fontana, Calif. K1 ..... 5.75
Gary, Ind. C3 ..... 5.15
Geneva, Utah G1 ..... 5.10
Ind. Harbor, Ind. I-2 ..... 5.15
Ind. Harbor, Ind. Y1 ..... 5.40
Johnstown, Pa. B2 ..... 5.20
Lackawanna, N.Y. (14) B2 ..... 5.20
LosAngeles B3 ..... 5.75
Munhall, Pa. C3 ..... 5.15
So. Chicago, Ill. C3 ..... 5.15
So. SanFrancisco B3 ..... 5.70
Struthers, O. Y1 ..... 5.40

Wide Flange
BethlehemPa. B2 ..... 3.45
Lackawanna, N.Y. B2 ..... 3.45
Munhall, Pa. C3 ..... 3.40
So. Chicago, Ill. C3 ..... 3.40

H.S., L.A. Wide Flange
Bethlehem, Pa. B2 ..... 5.20
Lackawanna, N.Y. B2 ..... 5.20
Munhall, Pa. C3 ..... 5.10
So. Chicago, Ill. C3 ..... 5.10

SHEET STEEL PILING
Ind. Harbor, Ind. I-2 ..... 4.20
Lackawanna, N.Y. B2 ..... 4.20
Munhall, Pa. C3 ..... 4.20
So. Chicago, Ill. C3 ..... 4.20
Weirton, W. Va. W6 ..... 4.20

BEARING PILES
Munhall, Pa. C3 ..... 3.40
So. Chicago, Ill. C3 ..... 3.40

PLATES, High-Strength Low-Alloy
Aliquippa, Pa. J5 ..... 5.35
Bessemer, Ala. T2 ..... 5.35
Clairton, Pa. C3 ..... 5.35
Cleveland J5, R2 ..... 5.35
Conshohocken, Pa. A3 ..... 5.60
Ecorse, Mich. G5 ..... 5.85
Fairfield, Ala. T2 ..... 5.35
Fontana, Calif. K1 ..... 5.95
Gary, Ind. C3 ..... 5.35
Geneva, Utah G1 ..... 5.35
Ind. Harbor, Ind. I-2, ... 5.35
Ind. Harbor, Ind. Y1 ..... 5.60
Johnstown, Pa. B2 ..... 5.35
Munhall, Pa. C3 ..... 5.35
Pittsburgh J5 ..... 5.35
Sharon, Pa. S3 ..... 5.70
So. Chicago, Ill. C3 ..... 5.35
SparrowsPoint, Md. B2 .. 5.35
Warren, O. R2 ..... 5.35
Youngstown Y1 ..... 5.60

PLATES, Open-Hearth Alloy
Claymont, Del. W16 ..... 4.50
Coatesville, Pa. L7 ..... 4.80
Conshohocken, Pa. A3 ..... 4.55
Fontana, Calif. K1 ..... 5.40
Gary, Ind. C3 ..... 4.40
Johnstown, Pa. B2 ..... 4.40
Munhall, Pa. C3 ..... 4.40
Sharon, Pa. S3 ..... 4.75
So. Chicago, Ill. C3 ..... 4.40
SparrowsPoint, Md. B2 ..... 4.40

FLOOR PLATES
Cleveland J5 ..... 4.55
Conshohocken, Pa. A3 ..... 4.55
Harrisburg, Pa. C5 ..... 5.25
Ind. Harbor, Ind. I-2 ..... 4.55
Munhall, Pa. C3 ..... 4.55
So. Chicago, Ill. C3 ..... 4.55

PLATES (Universal Mill)
Fontana, Calif. K1 ..... 4.40

PLATES, Carbon A.R.
Fontana, Calif. K1 ..... 5.25

PLATES, Carbon Steel
AlabamaCity, Ala. R2 ..... 3.50
Aliquippa, Pa. J5 ..... 3.50
Ashland, Ky. (15) A10 ..... 3.50
Bessemer, Ala. T2 ..... 3.50
Clairton, Pa. C3 ..... 3.50
Claymont, Del. W16 ..... 3.90
Cleveland J5 R2 ..... 3.50
Coatesville, Pa. L7 ..... 3.90
Conshohocken, Pa. A3 ..... 3.75
Ecorse, Mich. G5 ..... 3.75
Fairfield, Ala. T2 ..... 3.50
Fontana, Calif. K1 ..... 4.10
Gary, Ind. C3 ..... 3.50
Granite City, Ill. G4 ..... 4.20
Geneva, Utah G1 ..... 3.50
Harrisburg, Pa. C5 ..... 4.25
Houston, Tex. S5 ..... 3.90
Ind. Harbor, Ind. I-2, Y1 ..... 3.50
Johnstown, Pa. B2 ..... 3.50
Lackawanna, N.Y. B2 ..... 3.50
Minnequa, Colo. C10 ..... 4.30
Munhall, Pa. C3 ..... 3.50
Pittsburgh J5 ..... 3.50
Sharon, Pa. S3 ..... 3.75
Sharon, Pa. S3 ..... 3.50
So. Chicago, Ill. C3, W14 ..... 3.50
SparrowsPoint, Md. B2 ..... 3.50
Steubenville, O. W10 ..... 3.50
Warren, O. R2 ..... 3.50
Weirton, W. Va. W6 ..... 3.50
Youngstown C3, R2, Y1 ..... 3.50

PLATES, Wrought Iron
Economy, Pa. B14 ..... 7.85

PLATES, Ingot Iron
Ashland, c.l. (15) A10 ..... 3.75
Ashland, lcl (15) A10 ..... 4.25
Cleveland, cl. R2 ..... 4.10
Warren, O. cl R2 ..... 4.10

BARS, Hot-Rolled Carbon
AlabamaCity, Ala. R2 ..... 3.45
Aliquippa, Pa. J5 ..... 3.45
Alton, Ill. (1) L1 ..... 3.45
Atlanta, Ga. A11 ..... 4.00
Bessemer, Ala. T2 ..... 3.45
Buffalo R2 ..... 3.45
Canton, O. R2 ..... 3.45
Clairton, Pa. C3 ..... 3.45
Cleveland R2 ..... 3.45
Ecorse, Mich. G5 ..... 3.65
Emeryville, Calif. J7 ..... 4.20
Fairfield, Ala. T2 ..... 3.45
Fontana, Calif. K1 ..... 4.10
Gary, Ind. C3 ..... 3.45
Houston, Tex. S5 ..... 3.85
Ind. Harbor, Ind. I-2, Y1 ..... 3.45
Johnstown, Pa. B2 ..... 3.45
KansasCity, Mo. S5 ..... 4.05
Lackawanna, N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.15
Milton, Pa. B6 ..... 3.70
Minnequa, Colo. C10 ..... 3.90
Niles, Calif. P1 ..... 4.17
N. Tonawanda, N.Y. B11 ..... 3.45
Pittsburg, Calif. C11 ..... 4.15
Pittsburgh J5 ..... 3.45
Portland, Oreg. O4 ..... 4.40
Seattle B3, N14 ..... 4.20
So. Chicago C3, R2, W14 ..... 3.45
So. Duquesne, Pa. C3 ..... 3.45
S. SanFran., Cal. B3 ..... 4.20
Struthers, O. Y1 ..... 3.45
Torrance, Calif. C11 ..... 4.15
Weirton, W. Va. W6 ..... 3.45
Youngstown C3, R2 ..... 3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa, Pa. J5 ..... 3.45
Atlanta A11 ..... 4.00
Johnstown, Pa. B2 ..... 3.45
Lackawanna, N.Y. B2 ..... 3.45
Niles, Calif. P1 ..... 4.17
Pittsburgh (23) J5 ..... 3.45
Portland, Oreg. O4 ..... 4.20
SanFrancisco S7 ..... 4.00
Weirton, W. Va. W6 ..... 3.45

BAR SIZE ANGLES; H.R. CARBON
Bethlehem, Pa. B2 ..... 3.65

BARS, Hot-Rolled Alloy
Bethlehem, Pa. B2 ..... 3.95
Buffalo R2 ..... 3.95
Canton, O. R2, T7 ..... 3.95
Clairton, Pa. C3 ..... 3.95
Ecorse, Mich. G5 ..... 4.25
Fontana, Calif. K1 ..... 4.95
Gary, Ind. C3 ..... 3.95
Houston, Tex. S5 ..... 4.35
Ind. Harbor, Ind. I-2, Y1 ..... 3.95
Johnstown, Pa. B2 ..... 3.95
KansasCity, Mo. S5 ..... 4.55
Lackawanna, N.Y. B2 ..... 3.95
LosAngeles B3 ..... 5.00
Massillon, O. R2 ..... 3.95
Midland, Pa. C18 ..... 3.95
So. Chicago C3, R2, W14 ..... 3.95
So. Duquesne, Pa. C3 ..... 3.95
Struthers, O. Y1 ..... 3.95
Warren, O. C17 ..... 4.20
Youngstown C3 ..... 3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton, Pa. C3 ..... 4.20
Fontana, Calif. K1 ..... 4.95
Gary, Ind. C3 ..... 4.20
Youngstown C3 ..... 4.20

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa, Pa. J5 ..... 5.20
Atlanta A11 ..... 5.35
Bessemer, Ala. T2 ..... 5.20
Bethlehem, Pa. B2 ..... 5.20
Clairton, Pa. C3 ..... 5.20
Cleveland R2 ..... 5.20
Ecorse, Mich. G5 ..... 5.65
Fairfield, Ala. T2 ..... 5.20
Fontana, Calif. K1 ..... 6.25
Gary, Ind. C3 ..... 5.20
Ind. Harbor, Ind. I-2 ..... 5.20
IndianaHarbor, Ind. Y1 .. 5.45
Johnstown, Pa. B2 ..... 5.20
Lackawanna, N.Y. B2 ..... 5.20
LosAngeles B3 ..... 5.90
Pittsburgh J5 ..... 5.20
So. Duquesne, Pa. C3 ..... 5.20
So. SanFrancisco B3 ..... 5.95
Struthers, O. Y1 ..... 5.45
Youngstown C3 ..... 5.20

BARS, Cold-Finished Carbon
Aliquippa, Pa. K5 ..... 4.15
Ambridge, Pa. W18 ..... 4.15
BeaverFalls, Pa. M12, R2 .. 4.15
Buffalo B5 ..... 4.15
Camden, N.J. P13 ..... 4.60
Carnegie, Pa. C12 ..... 4.15
Chicago W18 ..... 4.15
Cleveland A7, C20 ..... 4.15
Detroit P17 ..... 4.30
Donora, Pa. A7 ..... 4.15
Ecorse, Mich. G5 ..... 4.35
Elyria, O. W8 ..... 4.15
FranklinPark, Ill. N5 ..... 4.15
Gary, Ind. R2 ..... 4.15
Hammond, Ind. L2, M13 .. 4.15
Hartford, Conn. R2 ..... 4.55
Harvey, Ill. B5 ..... 4.15
LosAngeles R2 ..... 5.55
Mansfield, Mass. B5 ..... 4.55
Massillon, O. R2, R8 ..... 4.15
Midland, Pa. C18 ..... 4.15
Monaca, Pa. S17 ..... 4.15
Newark, N.J. W18 ..... 4.55
Plymouth, Mich. P5 ..... 4.40
Pittsburgh J5 ..... 4.15
Putnam, Conn. W18 ..... 4.55
Readville, Mass. C14 ..... 4.55
St. Louis, Mo. M5 ..... 4.55
So. Chicago, Ill. W14 ..... 4.15
SpringCity, Pa. (5) K3 ..... 4.55
Struthers, O. Y1 ..... 4.15
Waukegan, Ill. A7 ..... 4.15
Youngstown F3, Y1 ..... 4.15

BARS, Cold-Finished Alloy
Aliquippa, Pa. K5 ..... 4.90
Ambridge, Pa. W18 ..... 4.90
BeaverFalls, Pa. M12 ..... 4.90
Bethlehem, Pa. B2 ..... 4.90
Buffalo B5 ..... 4.90
Canton, O. R2, T7 ..... 4.90
Carnegie, Pa. C12 ..... 4.90
Chicago W18 ..... 4.90
Cleveland A7, C20 ..... 4.90
Detroit P17 ..... 5.05
Donora, Pa. A7 ..... 4.90
Elyria, O. W8 ..... 4.90
Gary, Ind. R2 ..... 4.90
Hammond, Ind. L2, M13 .. 4.90
Hartford, Conn. R2 ..... 5.20
Harvey, Ill. B5 ..... 4.90
Lackawanna, N.Y. B2 ..... 4.90
Mansfield, Mass. B5 ..... 5.20
Massillon, O. R2, R8 ..... 4.90
Midland, Pa. C18 ..... 4.90
Monaca, Pa. S17 ..... 4.90
Newark, N.J. W18 ..... 5.20
Plymouth, Mich. P5 ..... 5.10
So. Chicago, Ill. R2, W14 .. 4.90
Struthers, O. Y1 ..... 4.90
Warren, O. C17 ..... 4.90
Waukegan, Ill. A7 ..... 4.90
Worcester, Mass. A7 ..... 5.20
Youngstown F3, Y1 ..... 4.90

RAIL STEEL BARS
ChicagoHts. (3) I-2, C2 ..... 4.00
ChicagoHts. (4) I-2 ..... 3.45
Dallas, Tex. (4) S20 ..... 6.00
Franklin, Pa. (3) F5 ..... 4.00
FortWorth, Tex. (26) T4 .. 4.63
Huntngtn, W.Va. (3) W7 .. 4.00
Marion, O. (3) P11 ..... 4.00
Moline, Ill. (3) R2 ..... 3.55
Williamsport (3) S19 ..... 4.50
Williamsport (4) S19 ..... 4.60

BARS, Wrought Iron
Economy, Pa. (S.R.) B14 .. 8.60
Economy, Pa. (D.R.) B14 .. 11.00
Economy (Staybolt) B14 .. 11.30
Dover, N.J. (Staybolt) U1 .. 15.00
Dover (Eng. Bolt) U1 .. 13.50
Dover (Wrgt. Iron) U1 .. 12.25
McK. Rks. (S.R.) L5 .. 8.60
McK. Rks. (D.R.) L5 .. 11.25

BARS, Reinforcing (Fabricators)
AlabamaCity, Ala. R2 ..... 3.45
Alton, Ill. (6) L1 ..... 3.45
Atlanta A11 ..... 4.00
Buffalo R2 ..... 3.45
Cleveland R2 ..... 3.45
Emeryville, Calif. J7 ..... 4.20
Fairfield, Ala. T2 ..... 3.45
Fontana, Calif. K1 ..... 4.10
Gary, Ind. C3 ..... 3.45
Houston, Tex. S5 ..... 3.85
Ind. Harbor, Ind. I-2, Y1 .. 3.45
Johnstown, Pa. B2 ..... 3.45
KansasCity, Mo. S5 ..... 4.05
Lackawanna, N.Y. B2 ..... 3.45
LosAngeles B3 ..... 4.15
Milton, Pa. B6 ..... 3.70
Minnequa, Colo. C10 ..... 4.25
Niles, Calif. P1 ..... 4.17
Pittsburg, Calif. C11 ..... 4.15
Pittsburgh J5 ..... 3.45
Portland, Oreg. O4 ..... 4.70
Seattle B3, N14 ..... 4.20
So. Chicago, Ill. R2 ..... 3.45
So. Duquesne, Pa. C3 ..... 3.45
So. SanFrancisco B3 ..... 4.20
SparrowsPoint, Md. B2 ..... 3.45
Struthers, O. Y1 ..... 3.45
Torrance, Calif. C11 ..... 4.15
Youngstown C3, R2 ..... 3.45

BARS, Reinforcing (Fabricated; to Consumers)
Huntington, W.Va. W7 ..... 4.50
Johnstown, ¼-1" B2 ..... 4.35
LosAngeles B3 ..... 5.00
Marion, O. P11 ..... 4.75
Seattle B3, N14 ..... 5.10
SoSanFrancisco B3 ..... 5.00
SparrowsPt., ¼-1" B2 ..... 4.35
Williamsport, Pa. S19 ..... 4.35

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity, Ala. R2 ..... 3.35
Ashland, Ky. (8) A10 ..... 3.35
Butler, Pa. A10 ..... 3.35
Cleveland J5, R2 ..... 3.35
Conshohocken, Pa. A3 ..... 3.60
Detroit M1 ..... 4.15
Ecorse, Mich. (8) G5 ..... 3.55
Fairfield, Ala. T2 ..... 3.35
Fontana, Calif. K1 ..... 4.25
Gary, Ind. C3 ..... 3.35
GraniteCity, Ill. G4 ..... 4.05
Geneva, Utah G1 ..... 3.45
Ind. Harbor, Ind. I-2, Y1 .. 3.35
Irvin, Pa. C3 ..... 3.35
Lackawanna, N.Y. B2 ..... 3.35
Munhall, Pa. C3 ..... 3.35
Niles, O. N12 ..... 4.50
Pittsburg, Calif. C11 ..... 4.05
Pittsburgh J5 ..... 3.35
Sharon, Pa. S3 ..... 3.75
So. Chicago, Ill. W14 ..... 3.35
SparrowsPoint, Md. B2 ..... 3.35
Steubenville, O. W10 ..... 3.35
Torrance, Calif. C11 ..... 4.05
Warren, O. R2 ..... 3.35
Weirton, W. Va. W6 ..... 3.35
Youngstown C3, Y1 ..... 3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity, Ala. R2 ..... 4.50
Dover, O. R1 ..... 4.65
Ind. Harbor, Ind. I-2 ..... 4.40
Mansfield, O. E6 ..... 4.15
Niles, O. N12 ..... 5.00
Torrance, Calif. C11 ..... 5.15

SHEETS, H-R (14-ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 ..... 5.05
Conshohocken, Pa. A3 ..... 5.30
Ecorse, Mich. G5 ..... 5.50
Fairfield, Ala. T2 ..... 5.05
Fontana, Calif. K1 ..... 6.00
Gary, Ind. C3 ..... 5.05
Ind. Harbor, Ind. I-2 ..... 5.05
IndianaHarbor, Ind. Y1 .. 5.30
Irvin, Pa. C3 ..... 5.05
Lackawanna (35) B2 ..... 5.05
Pittsburgh J5 ..... 5.05
Sharon, Pa. S3 ..... 5.40
So. Chicago, Ill. C3 ..... 5.05
SparrowsPoint (36) B2 ..... 5.05
Warren, O. R2 ..... 5.05
Weirton, W. Va. W6 ..... 5.30
Youngstown, C3 ..... 5.05
Youngstown, Y1 ..... 5.30

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ..... 6.20
Ecorse, Mich. G5 ..... 6.65
Fontana, Calif. K1 ..... 7.05
Gary, Ind. C3 ..... 6.20
Ind. Harbor, Ind. I-2, ... 6.20
IndianaHarbor, Ind. Y1 .. 6.45
Irvin, Pa. C3 ..... 6.20
Lackawanna (37) B2 ..... 6.20
Pittsburgh J5 ..... 6.20
SparrowsPoint (38) B2 .. 6.20
Warren, O. R2 ..... 6.20
Weirton, W. Va. W6 ..... 6.45
Youngstown Y1 ..... 6.45

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.80
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	5.10
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind.(13) C16	4.80
MartinsFerry,O. W10	4.40
Niles,O. N12	5.50
Pittsburg, Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind.(13) C16	5.35
Niles,O. N12	6.05

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	5.30
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.45
Gary,Ind. C3	6.35
Irvin,Pa. C3	6.35
SparrowsPoint,Md. B2	6.45
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.00
Follansbee,W.Va.(23) F4	5.70

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.80	...
MartinsFy.O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45
Fairfield,Ala. T2	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Wrought Iron

	An'l	Galv.
Apollo,Pa. B14	12.60	16.85

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance,Calif. C11	4.05

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

SHEETS, Well Casing

Fontana,Calif. K1	4.80

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10(cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill.G4(cut lengths)	...	...	7.40	8.65	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	6.50	7.00	...	...
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	....
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	....	....	....
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.20	14.70
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

TIN PLATE, American COKE (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary C3	7.30	7.50
Ind.Har. I-2, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.75
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	5.10
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Youngstown Y1	4.40

STRIP, HOT-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	5.20
Ecorse,Mich. G5	5.40
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	5.90
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2	4.95
IndianaHarbor,Ind. Y1	5.20
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	5.70
Sharon,Pa. S3	5.30
So.SanFrancisco(25) B3	5.70
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	5.20
Youngstown Y1	5.20
Youngstown C3	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.45
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity, Mo. S5	5.70
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S3	5.45
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.25
Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.80
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.75
Buffalo(2(.) R2	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.75
Conshohocken,Pa. A3	3.50
Detroit M1	4.05
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.50
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.75
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.75
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.50
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	10.10
Carnegie,Pa. S18	10.10
Cleveland A7	9.50
Dover,O. G6	10.00
Fontana,Calif. K1	11.15
Harrison,N.J. C1S	10.00
NewBritn,Conn.(10) S15	10.10
Pawtucket,R.I.(11) NS	9.50
Pawtucket,R.I.(12) NS	9.80
Sharon,Pa. S3	10.10
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bridgeprt,Conn.(10) S15	4.80	6.30	6.90	8.80	11.15
Bristol,Conn. W1	...	...	6.85	8.80	...
Carnegie,Pa. S18	...	6.30	6.90	8.85	11.15
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Detroit D2	5.10	6.15	6.75	...	...
Detroit(21) D2	5.35	6.25	6.85	...	...
Dover,O. G6	5.00	6.30	6.90	8.85	11.15
FranklinPark,Ill. T6	4.50	6.10	6.70	8.65	...
Harrison,N.J. C1S	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.85	6.30	6.90	8.85	11.15
NewCastle,Pa. B4	4.85	6.30	6.90	8.85	...
NewCastle,Pa. E5	5.00	6.30	6.90	8.85	11.15
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. NS					
Cleve-or-Pitts.Base	4.70	5.95	6.55	8.50	10.80
Worcester,Base	4.65	6.25	6.85	8.80	11.10
Sharon,Pa. S3	4.85	6.30	6.90	8.85	11.15
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.15	5.95	6.55	8.50	10.80
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C1S	...	...	9.30	11.25	13.85

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40)	5.00
Berea,O. C7	6.60
Bridgeprt,Conn.(10)	S15 4.85
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	5.10
Detroit D2	5.10
Detroit M1	4.95
Dover,O. (40) G6	5.00
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.85
Fontana,Calif. K1	5.75
FranklinPark,Ill. T6	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.15
LosAngeles C1	4.85
Mattapan,Mass. T6	5.00
Middletown,O. A10	4.15
NewBritain(10) S15	4.85
NewCastle,Pa. B4	4.85
NewCastle,Pa.(40) E5	4.75
NewHaven,Conn. D2	5.35
NewHaven,Conn. A7	4.65
NewYork W3	5.00
Pawtucket,R.I. R3	5.15
Pawtucket,R.I.(21)	NS 5.00
Riverdale,Ill. A1	4.50
Rome,N.Y. R6	4.15
Sharon,Pa. S3	4.85
SparrowsPoint,Md. B2	4.15
Trenton,N.J. R5	5.50
Wallingford,Conn. W2	5.00
Warren,O.(40) T5	4.75
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown C8, (40)	4.50
Youngstown Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland ... J5	6.20
Dover,O. G6	6.80
Ecorse,Mich. G5	6.65
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.45
Youngstown Y1	6.45

STRIP, Electro Galvanized

Dover,O. G6	5.00
Weirton,W.Va. W6	4.15
Youngstown C8	4.15
Warren,O. T5	4.75

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A.M. Byers Co.

C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta A11	3.80
Riverdale Ill. A1	3.40
Sharon,Pa. S3	3.90
Youngstown C3	3.40

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill. (1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Fostoria,O. S1	6.20
Johnstown, Pa. B2	5.90
Los Angeles B3	6.85
Millbury,Mass.(12) N6	6.20
Monessen,Pa. P7, P16	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Williamsport,Pa. B2	6.00
Worcester A7,J4,T6,W12	6.20
Worcester,Mass. N6	6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	5.70
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville,Ind. MS	5.35
Dover,O. G6	5.70
Fostoria,O. S1	6.00
Kokomo, Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P16	5.35
Monessen,Pa. P7	5.60
Pawtucket,R.I.(12) N8	6.00
Trenton,N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville,Ind. MS	8.45
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.45
Kokomo,Ind. C16	8.45
Monessen,Pa. P16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.45
Worcester,Mass. A7, T6	8.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.55
Monessen,Pa. P16	10.80
Roebling,N.J. R5	10.80

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.85
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20, R2	4.50
Crawfordsville,Ind. MS	4.60
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O. (24) S1	5.00
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.85
Los Angeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.75
Newark, 6-Sga. I-1	5.15
No.Tonawanda B11	4.50
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago, Ill. R2	4.50
So.SanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.80
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester,Mass. A7	4.80
Worcester,Mass. T6	4.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
Los Angeles B3	6.50
Monessen,Pa. P7, P16	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.15
Monessen,Pa. P16	8.15
Roebling,N.J. R5	8.45
SparrowsPoint,Md. B2	8.25

ROPE WIRE

	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.35	8.35	8.60
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P16	8.05	8.05	8.30
Monessen,Pa. P7	8.30	8.30	8.55
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.35	8.35	8.60
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquappa J5	5.35	5.80
Atlanta A11	5.70	5.95
Bartonville(19)K4	5.35	5.80
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.50
Crawfordsville MS	5.45	5.95
Donora A7	5.35	5.50
Duluth A7	5.35	5.50
Fairfield T2	5.35	5.50
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.80
Joliet,Ill. A7	5.35	5.50
KansasCy.Mo. S5	5.95	6.20
Kokomo C16	5.70	5.95
LosAngeles B3	6.30	...
Minnequa C10	5.60	6.10
Monessen P7	5.60	5.85
Palmer(31) W12	4.80	...
Pitts.Calif. C11	6.30	6.45
Prtsmth.(18)P12	5.35	5.60
Rankin A7	5.35	5.50
So.Chicago R2	5.35	5.60
So.S.Fran. C10	6.30	6.80
SparrowPt. B2	5.45	5.90
Sterling,Ill.(1)N15	5.65	5.85
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7	5.65	5.80

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Aliquippa J5	9.80	11.50
Bartonville(1)K4	5.35	5.80
Cleveland A7	9.80	11.20
Crawfordsville MS	9.80	11.30
Fostoria,O. S1	10.40	12.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	10.05	12.05
Palmer,Mass. W12	9.80	11.30
Pitts.,Cal. C11	10.15	11.55
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	130
Atlanta A11	133
Bartonville,Ill.(19) K4	126
Crawfordsville MS	135
Donora,Pa. A7	124
Duluth,Minn. A7	124
Fairfield,Ala. T2	124
Houston,Tex. S5	134
Johnstown,Pa. B2	130
Joliet,Ill. A7	124
KansasCity,Mo. S5	138
Kokomo,Ind. C16	135
Minnequa,Colo. C10	136
Monessen,Pa. P7	133
Pittsburg,Calif. C11	144
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	124
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	151
SparrowsPoint,Md. B2	132
Sterling,Ill.(1) N15	133

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	125
Duluth A7	116
Franklin,Pa. F5	125
Huntington,W.Va. W7	125
Johnstown,Pa. B2	125
Joliet,Ill. A7	116
Marion,O. P11	125
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	130

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	116
Ala.City,Ala.,17-18ga.R2	198
Aliquippa,Pa.9-14½ga.J5	120
Atlanta A11	123
Bartonville,Ill.(19) K4	116
Crawfordsville,Ind. MS	123
Donora,Pa. A7	114
Duluth A7	120
Houston,Tex. S5	124
Fairfield,Ala. T2	114
Johnstown,Pa. B2	120
Johnstn,17ga.6" B2	194
Johnstn,17ga.,4" B2	197
Joliet,Ill. A7	114
KansasCity,Mo. S5	128
Kokomo,Ind. C16	123
Minnequa,Colo. C10	128
Monessen,Pa. P7	123
Pittsburg,Calif. C11	137
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	114
So.Chicago,Ill. R2	116
Sterling,Ill.(1) N15	118

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	113
Atlanta A11	119
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville MS	120
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity, Mo. S5	125
Kokomo, Ind. C16	120
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Sterling,Ill.(1) N15	119

AXLES

Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	5.60
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.60
Struthers,O. Y1	5.60
Youngstown R2	5.60

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...
Williamsport,Pa. S19	...	...	...	4.25

NAILS & STAPLES, Stock To dealers & mfrs. (7)

	Col.
AlabamaCity,Ala. R2	106
Aliquippa,Pa. (13) J5	106
Atlanta A11	113
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	111
Crawfordsville,Ind. MS	112
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	118
Kokomo,Ind. C16	112
Minnequa,Colo. C10	111
Monessen,Pa. P7	112
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	112
Torrance,Calif. C11	126
Worcester,Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfordsville,Ind. MS	5.90
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.65
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Sterling,Ill.(1) N15	5.65
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N.Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Seattle B3	4.35
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.20

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	9.10
Pittsburgh O3, P14	9.10
Seattle B3	9.35

Key to Producing Companies

M1	McLouth Steel Corp.	P12	Porthsmouth Division, Detroit Steel Corp.
M4	Mahoning Valley Steel	P13	Precision Drawn Steel
M5	Medart Co.	P14	Pitts.Screw & Bolt Co.
M6	Mercer Tube & Mfg. Co.	P15	Pittsburgh Metallurgical
M8	Mid-States Steel & Wire	P16	Page Steel & Wire Div., Amer. Chain & Cable
M9	Midvale Co.	P17	Plymouth Steel Co.
M10	Missouri-Illinois Furnace	R1	Reeves Steel & Mfg. Co.
M12	Moltrup Steel Products	R2	Republic Steel Corp.
M13	Monarch Steel Co.	R3	Rhode Island Steel Corp.
M14	McInnes Steel Co.	R5	Roebling's Sons, John A.
N2	National Supply Co.	R6	Rome Strip Steel Co.
N3	National Tube Co.	R7	Rotary Electric Steel Co.
N5	Nelsen Steel & Wire Co.	R8	RelianceDiv.,EatonMfg.
N6	NewEng.HighCarb.Wire	S1	Senaca Wire & Mfg. Co.
N8	Newman-Crosby Steel	S3	Sharon Steel Corp.
N12	Niles Rolling Mill Co.	S5	Sheffield Steel Corp.
N14	Nrthwst. Steel Roll.Mills	S6	Shenango Furnace Co.
N15	Northwestern S.&W. Co.	S7	Simmons Co.
N16	New Delphos Mfg. Co.	S8	Simonds Saw & Steel Co.
O3	Oliver Iron & Steel Corp.	S9	Sloss-Sheffield,S.&I. Co.
O4	Oregon Steel Mills	S13	Standard Forgings Corp.
P1	Pacific States Steel Corp.	S14	Standard Tube Co.
P2	Pacific Tube Co.	S15	Stanley Works
P4	Phoenix Iron & Steel Co.	S16	Struthers Iron & Steel
P5	Pilgrim Drawn Steel	S17	Superior Drawn Steel Co.
P6	Pittsburgh Coke&Chem.	S18	Superior Steel Corp.
P7	Pittsburgh Steel Co.	S19	Sweet's Steel Co.
P9	Pittsburgh Tube Co.	S20	Southern States Steel
P11	Pollak Steel Co.	T2	Tenn. Coal, Iron & R.R.
		T3	Tenn.Prod. & Chem.
		T4	Texas Steel Co.
		T5	Thomas Steel Co.
		T6	Thompson Wire Co.
		T7	Timken Roller Bearing
		T9	Tonawanda Iron Div. Am. Rad. & Stan. San.
		U1	Ulster Iron Works
		U4	Universal Cyclops Steel
		V2	Vanadium Alloys Steel
		V3	Vulcan Crucible Steel Co.
		W1	Wallace Barnes Co.
		W2	Wallingford Steel Co.
		W3	Washburn Wire Corp.
		W4	Washington Steel Corp.
		W6	Weirton Steel Co.
		W7	W. Va. Steel & Mfg. Co.
		W8	West.Auto.Mach.Screw
		W9	Wheatland Tube Co.
		W10	Wheeling Steel Corp.
		W12	Wickwire Spencer Steel Div., Colo. Fuel & Iron
		W13	Wilson Steel & Wire Co.
		W14	Wisconsin Steel Div. International Harvester
		W15	Woodward Iron Co.
		W16	Worth Steel Co.
		W18	Wyckoff Steel Co.
		Y1	Youngstown Sheet&Tube

TOOL STEELS

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50-31.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, T7, U4, V2, V3.

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base
(13) Add 0.50c for 17 Ga & heavier.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 14 gage.
(24) Deduct 0.20c for finer than 15 gage.
(25) Bar mill bands.
(26) Reinforcing, to fabricators (⅜" bar elec. furn. billet, 5.03c); to consumers, 5.28c.
(27) Bar mill sizes.
(28) Ronderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	36.5	34.5	33.5	4.0	2.0	4.0
¼	6.0	0.42	33.5	31.5	30.5	4.0	2.0	5.0
⅜	6.0	0.57	29.0	27.0	26.0	+1.5	+3.5	0.5
½	8.5	0.85	40.5	38.5	39.5	18.5	16.5	18.5
¾	11.5	1.13	43.5	41.5	42.5	22.5	20.5	21.5
1	17.0	1.68	46.0	44.0	45.0	26.0	24.0	25.0
1¼	23.0	2.28	46.5	44.5	45.5	26.5	24.5	25.5
1½	27.5	2.73	47.0	45.0	46.0	27.5	25.5	26.5
2	37.0	3.68	47.5	45.5	46.5	28.0	26.0	27.0
2½	58.5	5.82	48.0	46.0	47.0	28.5	26.5	27.5
3	76.5	7.62	48.0	46.0	47.0	28.5	26.5	27.5

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 points lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 43% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1.

Column D: Monaca, Pa. P9 quotes 1½ pts higher on ⅛" and ¼", 2 pts higher on ⅜", 1½ pts higher on ½" and ¾", 1 pt higher on 1" and 1¼", ½ pt higher on 1½" through 3"; Sharon, Pa. M6 quotes 1 pt lower on ⅛", 1½ pts higher on ¼", ½ pt higher on ⅜" and 1 pt lower on ½", ½ pt lower on ¾", 1½ pts lower on 1" and 1¼", 2 pts lower on 1½" through 3"; Butler, Pa. F6, ⅛" through ⅜"; Benwood, W. Va. W10 quotes 3 pts lower on ⅛", 2 pts lower on ¼", 3 pts lower on ⅜"; Wheatland, Pa. W9 quotes ½ pt lower on ⅛" and ¼", 2½ pts higher on ½" and ¾", 2 pts higher on 1" and 1¼", 1½ pts higher on 1½" through 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, plus 23% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5 quotes 1 pt lower on ¾", 2 pts lower on 1", 1½ pts lower on 1¼", 2 pts lower on 1½" and 2", 1½ pts lower on 2½" and 3"; Etna, Pa. N2 plus 23% on 3½" and 4". Fontana, Calif. K1 quotes 11 pts lower on ½" and larger continuous weld and 11% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	17.5	36.0	17.5
2½	58.5	5.82	39.0	20.5	39.0	20.5
3	76.5	7.62	39.0	20.5	39.0	20.5
3½	92.0	9.20	41.0	22.5	41.0	22.5
4	$1.09	10.89	41.0	22.5	41.0	22.5
5	1.48	14.81	41.0	22.5	41.0	22.5
6	1.92	19.18	41.0	22.5	41.0	22.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 3 pts lower on 2", 2½ pts lower on 2½-6 in.; Lorain, N3 quotes 1½ pts lower; Youngstown, Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16 17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2½	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base 10%	Both Sides	—Sheets— Carbon Base 10%	20%	Cu Base Both Sides
302	....	....	....	....	19.75	24.00	77.00
						24.00	
304	23.50	26.50–28.00	....	....	20.75–23.50	24.00–25.50	77.00
309	29.00	33.50	....	....	....	....	....
310	35.00	39.50	....	....	....	....	144.00
316	28.00	31.00–32 50	....	....	26.00	33.00–34.50	....
317	33.00	37.50	....	....	....	....	....
318	32.00	36.50	....	....	....	....	....
321	25.00	29.50	....	....	23.00	25.00	111.00
347	26.00	29.00–30.50	....	....	24.00	30.00–31.50	130.00
405	19.75	26.25	....	....	....	....	....
410	19.25	25.75	....	....	....	....	....
Nickel	31.00	41.00	33.50	45.00	....	....	....
Inconel	39.00	51.00	....	....	....	....	165.00
Monel	32.00	42.00	....	....	....	....	....
Copper*	....	....	21.70†	27.65‡	....	....	....

* Deoxidized. † 18.20c for hot-rolled. ‡ 24.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates. Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam.. 23
- ⅝-in. & ⅞-in. 26
- 1-in. and larger 26

Longer than 6 in.:
- All diams. 22

Lag bolts, all diams.:
- 6 in. and shorter 30
- over 6 in. long 28

Ribbed Necked Carriage. 26
Blank 40
Plow 40
Step, Elevator, Tap, and Sleigh Shoe 28
Tire bolts 20
Boiler & Fitting-Up bolts 37

NUTS

H.P. & C.P. Square:	Reg.	Heavy
½-in. & smaller	23	23
⅝-in. & ⅞-in..	20	15
1-in.-1½-in. ..	23	10
1⅛ in. & larger	16	10
H.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅞-in..	24	15
1-in.-1½-in. ..	20	11
1⅛ in. & larger	17	11
C.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅞-in..	30	25
1-in. & 1½-in.	27	20
1⅛ in. & larger	20	15

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Hvy.	Reg.
½-in. & smaller ..	35	41
⅝-in. & ⅞-in. ...	29	36
1-in.-1½-in.	23	31
1⅛-in. & larger ..	17	21
Light		
⅞-in. & smaller		41
1-in. to ⅝-in.		35
¾-in. to 1½-in.		33

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....56 & 10
Plated finishes .....41 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅞-in. & smaller 47
- ¾-in. through 1 in. ... 40

Longer than 6 in.:
- ⅞-in. & smaller 33
- ¾-in. through 1 in. ... 13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 44
1 in. and smaller diam. x over 6 in. 33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 41
¼-in. diam. & larger .. 24
N.F. thread, all diams... 18

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.25c
⅞-in. under .....43 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....List to 50c off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

—Inches— Diam.	Length	Cents per lb
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4.5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	39.00	32.00	30.00
302...	39.00	34.50	30.00
303...	41.00	38.00	32.50
304...	41.00	36.50	31.50
309...	53.50	52.50	43.00
316...	54.50	56.50	47.50
321...	47.00	46.00	35.50
347...	51.50	50.00	40.00
410...	34.50	28.50	24.50
416...	35.00	35.00	25.00
420...	42.00	45.00	30.00
430...	37.00	29.00	25.00
501...	25.50	24.00	13.00
502...	26.50	25.00	14.00

Baltimore, Types 301 through 347 sheet, except 309 E2.

Baltimore, bars, wire and structural A10.

Brackenridge, Pa., sheets A4.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., strip except Type 416, S18.

Cleveland, strip A7.

Detroit, strip, except Types 303, 309, 321, 416, 420, 501 and 502 M1.

Dunkirk, N.Y., bars, wire A4.

Duquesne, Pa., bars C3.

Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6.

Gary, Ind., sheets except Type 416 C3.

Harrison, N. J., strip C18.

Harrison, N. J., Types 302, 304, 316 wire and strip D6.

Massillon, all products R2.

McKeesport, Pa., bars, sheets except Type 416 C3.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars C3.

Pittsburgh, sheets C18.

Reading, Pa., bars & strip C4.

Sharon, Pa., strip, except Types 303, 309, 316, 416, 501 and 502 S3.

So. Chicago, Ill., bars & structurals C3.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.

Washington, Pa., bars, sheets & strip, except Type 309 sheets 54.00c and bars 43.50c, J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 59.50c, strip 61.50c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4.

Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-32.00
Toluol, one deg...21.00-28.00
Industrial xylol ..21.00-29.50
Per ton bulk, ovens
Sulphate of ammonia .$32-45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) ..17.25
Do., less than carlots..18.00
Do., tank cars 15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, corloads, effective CaF_2 content, 70% or more, $41; less than 60%, $38.

Imported, net ton, duty paid, metallurgical grade, $28-$29.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge Iron	Cents
98+% Fe, carlots	16.00
Swedish, c.i.f. New York, in bags...	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed 99+% Fe (minus 325 mesh)	48.50
Powder Flakes	44.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns..	70.00-135.00
Aluminum:	
Carlots, freight allowed	27.50
Atomized, 500 lb drums, freight allowed	32.50
Brass, 10-ton lots	30.00-33.25
Copper:	
Electrolytic	36.75
Reduced	33.75-37.00
Lead	23.00
Manganese:	
Minus 100-mesh	52.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel unannealed	75.50
Nickel-Silver, 10-ton lots	43.25
Silicon	34.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302	75.00
Tin	$1.375
Zinc, 10-ton lots	23.00-30.50
Tungsten:	Dollars
99%, minus 80 to 200 mesh, freight allowed:	
over 1000 lb	2.90
1000 lb	2.95
less than 1000 lb.	3.00
98.8% minus 65 mesh, freight allowed:	
1000 lb and over..	3.65
less than 1000 lb..	3.75
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb	2.75
82-88%, freight allowed, 2000 lb and over	2.40
less than 2000 lb..	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll.fur.	$14.00-14.50
Connellsvll.fdry.	16.00-17.00
New River, foundry	19.00
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.75
Everett, Mass., ovens	
New England, del.	†24.30
Chicago, ovens	21.00
Chicago del.	†22.45
Detroit, del.	24.91
Terre Haute, ovens	22.50
Milwaukee, ovens	23.00
Indianapolis, ovens	22.00
Chicago, del.	25.37
Cincinnati, del.	24.92
Detroit, del.	25.90
Ironton, O., ovens	21.50
Cincinnati, del.	24.06
Painesville, O., ovens	23.25
Buffalo, del.	25.37
Cleveland, del.	24.97
Erie, Pa., ovens	22.50
Birmingham, ovens	19.40
Birmingham, del.	20.45
Philadelphia, ovens	22.10
Neville Island, Pa., ovens	22.00
Swedeland, Pa., ovens	22.00
St. Louis, ovens	22.99
St. Louis, del.	24.12
Portsmouth, O., ovens	21.50
Cincinnati, del.	24.06
Detroit, ovens	23.00
Detroit, del.	*24.00
Buffalo, del.	26.04
Flint, del.	25.44
Pontiac, del.	24.39
Saginaw, del.	25.75

Includes representative switching charge of: *, $1.00; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York(city)	5.82	6.84	7.84	6.14	...	5.97	6.64	8.60	5.95	6.18	7.64
New York(e'try)	5.52	6.64	7.54	5.84	...	5.67	6.34	8.70	5.65	5.88	7.34
Boston (city) ..	5.95	6.75	7.89	5.90	...	5.80	6.39	8.70	5.95	6.58	7.48
Boston (e'try) .	5.75	6.55	7.60	5.70	...	5.60	6.19	8.50	5.75	6.38	7.28
Phila. (city) ..	6.60-6.70	6.75	7.20	5.90	...	5.85	6.46	8.40	5.70	5.90	7.00
Phila. (e'try) ..	6.35-6.45	6.50	6.95	5.65	...	5.60	6.21	8.15	5.45	5.65	6.75
Balt. (city) ...	5.35	6.59	6.77	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (e'try) ..	5.15	6.39	6.57	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va. ..	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Richmond, Va..	5.55	...	6.80	5.83	...	5.73	6.30	...	5.83	5.65	7.33
Wash (w'hse) .	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.)..	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10†††[3]	5.55	5.85	7.15
Buffalo (w'hse).	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90†††[3]	5.35	5.65	6.95
Pitts. (w'hse)..	5.15	5.95*	6.70-6.95	5.20	6.15	5.10	5.75	9.55††	5.25	5.35	6.60
Detroit (w'hse)	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86†††[3]	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.50	5.44	6.35	5.32	5.95	8.31	5.57	5.72	6.92
Cleve. (w'hse).	5.15	5.95	7.30	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city) ..	5.57	6.14	6.54	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city) .	5.35	6.15	7.15	5.30	...	5.30	5.85	9.75†††[3]	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.95	6.95	5.10	...	5.10	5.65	9.55†††[3]	5.25	5.40	6.60
Milwaukee(city)	5.49	6.29	7.29	5.44	...	5.44	6.00	9.89†††[3]	5.59	5.74	6.94
Milwau. (e'try).	5.29	6.09	7.09	5.24	...	5.24	5.89	9.69†††[3]	5.39	5.54	6.74
St. Louis (del.)	5.63	6.43	7.23	5.63	...	5.63	6.23	10.03†††[3]	5.73	5.92	7.13
St. L. (w'hse).	5.43	6.23	7.03	5.43	...	5.43	6.03	9.83†††[3]	5.53	5.73	6.93
Kans. City(city)	5.95	6.75	7.60	5.90	...	5.90	6.55	...	6.05	6.20	7.60
KansCity(w'hse)	5.75	6.55	7.40	5.70	...	5.70	6.35	...	5.85	6.00	7.40
Omaha, Nebr. .	6.13‡	...	8.33	6.13	...	6.13	6.98	...	6.13	6.33	7.83
Birm'ham (del.)	5.30	6.10	6.30[2]	5.26	...	5.25	6.88	...	5.40	5.70	7.33
Birm'hm(w'hse)	5.15	5.95	6.15[2]	5.10	...	5.10	...	...	5.25	5.55	...
Los Ang. (city)	6.10	7.65	7.90	6.15	8.90	6.10	7.75	...	6.10	6.20	8.40
L. A. (w'hse)..	5.90	7.45	7.70	5.95	8.70	5.90	7.55	...	5.90	6.00	8.20
San Francisco .	6.50[2]	7.60[2]	7.50[2]	7.45[2]	8.25[2]	6.30[2]	7.55	...	6.30[2]	6.40[2]	8.50[2]
Seattle-Tacoma.	6.60	8.15[2]	...	6.85	...	6.35	8.50	10.10	6.20	6.35[2]	8.40[2]

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [5]—1000 to 1999 lb; [7]—300 to 999 lb; [9]—400 to 9999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., $116.60. Hard-fired, St. Louis, Vandalia, Mo., Olive Hill, Ky., $156.20.

High-Heat Duty: Salina, Pa. $99.60; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, O., Ottawa, Ill., $94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $88; Bessemer, Ala., $79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., $79.20; Parral, O., $78.50; St. Marys, Pa., $76; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Chester, New Cumberland, W. Va., Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., $66.

Wire Cut: Chester, Wellsville, O., $64.

MALLEABLE BUNG BRICK

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., $105.60; Beach Creek, Pa., $94.60; Ottawa, Ill., $90.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $94.60; Hays, Pa., $100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., $104.50; Lehi, Utah, Los Angeles, $111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $93.50.

BASIC BRICK

Per net ton, Baltimore or Chester, Pa. Burned chrome brick, $73; chemical-bonded chrome brick, $77; magnesite brick, $99; chemical-bonded magnesite, $88.

MAGNESITE

Per net ton, Chewelah, Wash. Domestic dead-burned, ⅜" grains; bulk, $36.30; single paper bags, $41.80.

DOLOMITE

Per net ton. Domestic, burned bulk; Bonne Terre, Mo., $12.15; Martin, Millersville, Nario, Clay Center, Woodville, Gibsonburg, Bettsville, O., Billmeyer, Plymouth Meeting, Blue Bell, Williams, Pa., Millville, W. Va., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Chinese	$36.00
Brazilian	36.00
Bolivian	36.00
Domestic scheelite, del.	36.00

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$17.00-18.00
45% no ratio	17.30-18.30
48% no ratio	26.00
50% no ratio	27.00-27.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $70, Palmerton, Pa.; $71, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $174, f.o.b. Birmingham; $187, Johnstown, Pa.; $185, Sheridan, Pa.; $175, Etna, Pa.; $190, Chattanooga, Tenn. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 29.75c; ton lot 31.25c; less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese:, (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr. c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(Please turn to page 158)

Metal Consumers Face Crisis

NPA expected to order curtailments of 20 to 35 per cent in use of various metals for civilian products. Tin prices soar as market gets "out of hand"

New York — Steadily rising costs coupled with increasing demands for metals are creating a crisis in the metalworking industry. Pressure on producers to satisfy demands of their established customers while meeting steadily expanding defense needs will not be relieved until after the first of the year when National Production Administration's conservation orders become effective.

The tin market is definitely "out of hand" and many observers believe its stability can be restored only through government regulation. Many consumers of other major nonferrous metals are paying exorbitant prices for tonnages needed in excess of their quotas from regular suppliers; many others are curtailing their operations.

Controls—NPA is expected to issue limitation orders soon which will provide for cuts of 20 to 35 per cent in the use of various metals, to be effective not later than Jan. 1 in most instances. A drastic cut in the use of aluminum is expected to provide some 200 million pounds of metal for the stockpile in the first six months. The reduction is unofficially reported as being 35 per cent from consumption rate in the 12 months from July 1, 1949, to June 30, 1950. Conservation of copper, zinc, nickel and some other metals is expected to be placed on a similar basis.

These regulations, if issued, will force curtailments in production of automobiles, household appliances and other civilian goods. Fabricators are reviewing their World War II programs to find subsitute materials for the strategic ones. Many are running into major difficulties in such efforts.

Collapsible Tube Manufacturers Association, this city, points out: Tin is priced at too high a level to permit substitution of that metal for aluminum; lead has to be purchased at a 2-cent premium beyond the open market price. The Association suggests that the government should accept Canada's recent offer to provide 440 million pounds of aluminum during the next three years as a means of relieving the tight supply situation.

Zinc—In several branches of the nonferrous metal industry, market authorities are urging the government to suspend their purchases of metals for stockpiling purposes. Howard I. Young, president, American Zinc, Lead & Smelting Co., says the zinc industry is faced with the problem of trying to meet an industrial demand about 100 per cent greater than the prewar level and at the same time supply the government stockpile by diverting something like 30 per cent of normal output. He believes the solution of the problem is to defer further stockpiling for about six months.

Smelters' stocks of slab zinc dropped to only 9108 tons at the end of October from 10,267 at the end of September and 97,666 tons at the end of October, 1949. While production increased to 79,997 tons in October from 71,057, shipments jumped to 81,156 tons from 75,241. Unfilled orders at the end of October amounted to 64,436 tons.

Copper—Pending issuance of regulations by NPA, producers are allocating their supplies to regular customers on an unchanged price basis. Upward price revisions were effected, however, in bare copper wire and brass and bronze ingots. Consumption of copper by fabricators declined to 127,754 tons in September from 137,494 tons in August, due to the shortage of metal. Deliveries of copper to fabricators by primary producers totaled 119,529 tons in September, or about 8225 tons less than the amount consumed in that month. Stocks of copper in the hands of fabricators at the end of September amounted to 297,951 tons, a drop of 7223 tons from the preceding month. Visible supplies dropped sharply to only 9205 tons from 25,351 tons at the end of August, the smallest total recorded since 1941. Unfilled orders on fabricators' books at the end of September totaled 323,242 tons, a decline of about 11,000 tons. The deficit in the consumers' supply position at the end of September was 226,475 tons, an increase of about 13,000 tons.

Tin—Straits tin for delivery this month jumped to $1.52 a pound, although a somewhat easier trend developed late in the week. Spot was quoted $1.40 on Thursday. Domestic consumers are petitioning Washington to suspend purchases for the strategic stockpile, which aggregates an estimated 120,000 tons, and to resume selling at prices comparable with its average cost which is far below present quotations on the open market.

Aluminum Output at 6-Year High

New York—Production of primary aluminum in the United States in the third quarter reached the highest level since the second quarter of 1944. Even with this high rate of production, says Donald M. White, secretary, Aluminum Association, this city, the industry is unable to supply all the metal desired by civilian users after meeting mounting military needs. The 371,945,743-pound total for the third quarter topped the year's second quarter production of 360,707,827 pounds by about 3 per cent.

Primary aluminum production in September totaled 118,898,418 pounds, or more than 5 per cent below the 126,011,903 pounds for August. This decline is attributed to the shorter month and to the strike in one of the reduction plants which began in August and continued throughout September.

Sheet and plate shipments during the third quarter by member companies of the Association totaled 314,239,096 pounds, an increase of 16 per cent over the 271,157,929 pounds shipped in the second quarter. Shipments of these products were 109,770,305 pounds in September, or 3.3 per cent below the total of 113,531,771 pounds for August.

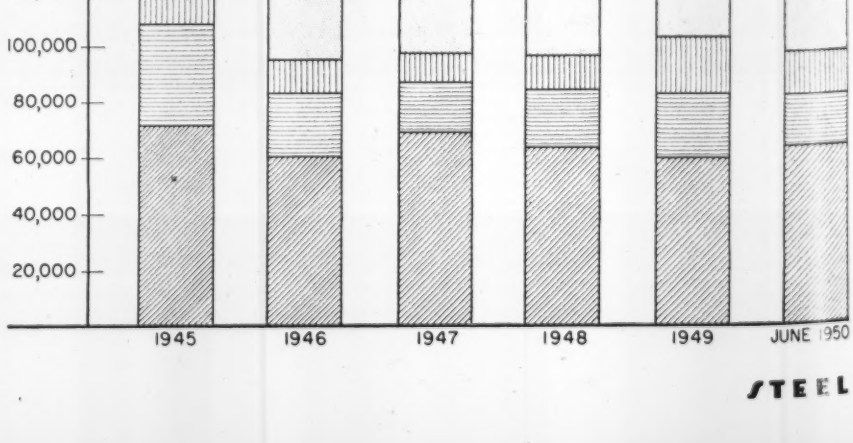
Copper Export Quota Fixed

Washington—Fourth-quarter quota of 30,000 net tons was established by the Office of International Trade, Department of Commerce, for the export of copper and copper products. No more than 23,000 net tons of refinery shapes will be licensed under the 30,000-ton quota. Applications have been received already in excess of the total quota, OIT reports.

World Tin Stocks Continue To Decline

. . . over 82 per cent held by U. S., UK and Malaya

(Long tons of tin content in concentrates and refined metal)



NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass ingot: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 44.50c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.60c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 29.75-30.25c; No. 12 foundry alloy (No. 2 grade) 29.50-29.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 31.00-31.50c; grade 2, 29.50-29.75c; grade 3, 29.00-29.25c; grade 4, 28.50-28.75c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, spot, prompt, Nov. 140.00c; Dec. 140.00c; Jan. 140.00c; Feb. 140.00c.

Antimony: American 99-99.8% and over but not meeting specifications below 32.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 32.50c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%; Chinese 34.00c; English, 32.75c; Belgian, 32.75c, duty paid, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 48.00c; 25-lb pigs, 50.50c; "XX" nickel shot, 51.50c; "F" nickel shot or ingots, for addition to cast iron, 48.50c. Prices include import duty.

Mercury: Open market, spot, New York $92.50-$95 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $30.00 per lb contained Be, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.40 del.; special or patented shapes $2.65.

Cobalt: 97-99%, $1.80 per lb for 500 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 80.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 39.93-41.68; yellow brass 36.86-38.28; commercial bronze, 95%, 39.91-41.61; 90%, 39.48-41.13; red brass, 85%, 38.54-40.14; 80%, 38.12-39.67; best quality, 39.15; nickel silver, 18%, 50.57-51.91; phosphor-bronze grade A, 5%, 58.49-60.20.

Rods: Copper, hot-rolled 35.78-37.53; cold-drawn 37.03-38.78; yellow brass free cutting, 31.26-32.63; commercial bronze, 95%, 39.60-41.30; 90%, 39.17-40.82; red brass 85%, 38.23-39.83; 80%, 37.81-39.36.

Seamless Tubing: Copper 39.97-41.72; yellow brass 39.87-41.29; commercial bronze, 90%, 42.14-43.79; red brass, 85%, 41.45-43.05; 80%, 42.58.

Wire: Yellow brass 37.15-38.57; commercial bronze, 95%, 40.20; 90%, 39.77-41.42; red brass, 85%, 38.83-40.43; 80%, 38.41-39.96; best quality brass, 39.44.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-29.42, l.c.l. 29.17-29.92, 100,000 lb lots 28.545-29.295; weatherproof, f.o.b. eastern mills, c.l. 29.60, l.c.l. 30.10, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Hexagonal— R317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 23.50-23.75c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 22.50-23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.00c; over 12-in., 23.50-24.00.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.00c. Strip, cold-rolled, 77.00c. Rods and shapes, 65.00c. Plates, 67.00c. Seamless tubes, 98.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 53.00c. Strip cold-rolled 56.00c. Rods and shapes, 51.00c. Plates, 52.00c. Seamless tubes, 86.00c. Shot and blocks, 46.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb. 55.00-62.00c; 25 to 99 lb. 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 36.59-38.34c; oval 36.09-37.84c; cast 37.37c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 55.6c, under 1000 lb 57.6c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,000 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 19.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 65.00c; 10,000 to 30,000 lb, 63.00c; 3000 to 10,000 lb, 67.00c, 500 to 3000 lb, 68.00c; 100 to 500 lb, 70.00c; under 100 lb, 73.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 33.50c; 400-lb bbl. 31.50c up to 10,000 lb, 31.00c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.75
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 26.00; No. 2 copper 25.00; light copper 24.00; composition red brass 22.00; radiators 17.50; heavy yellow brass 17.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 26.00; No. 2 copper 25.00; light copper 24.00; refinery brass (60% copper) per dry copper content 21.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 24.50-25.00; No. 2 22.50-23.00; light copper 21.00-21.50; No. 1 composition red brass 18.75-19.00; No. 1 composition turnings 18.25-18.50; mixed brass turnings 13.00-13.50; new brass clippings 18.50-19.00; No. 1 brass rod turnings 17.00-17.50; light brass 11.75-12.00; clean heavy yellow brass 15.00; new brass rod ends 17.50-18.00; auto radiators 15.25-15.50; cocks and faucets, 16.75-17.00; brass pipe 17.75-18.00.

Lead: Heavy 14.50-14.75; battery plates 8.75-9.00; linotype and stereotype 14.50-14.75; electrotype 12.75-13.00; mixed babbitt 12.25-12.50.

Zinc: Old zinc 11.00-11.25; new die cast scrap 10.75-11.00; old die cast scrap 8.00-8.25.

Tin: No. 1 pewter 63.00-65.00; block tin pipe 90.00; No. 1 babbitt 58.00-60.00.

Aluminum: Clippings 2S 18.50; old sheets 14.00-15.00; crankcase 15.00; borings and turnings 12.00-12.50.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Nov. 8-9	24.50	16.80	17.50	140.00	19.00	32.00	48.00	80.00
Nov. 7	24.50	16.80	17.50	152.00	19.00	32.00	48.00	80.00
Nov. 6	24.50	16.80	17.50	151.00	19.00	32.00	48.00	80.00
Nov. 3-4	24.50	16.80	17.50	136.00	19.00	32.00	48.00	80.00
Nov. 2	24.50	16.80	17.50	132.00	19.00	32.00	48.00	80.00
Nov. 1	24.50	16.80	17.50	127.50	19.00	32.00	48.00	80.00
Oct. Avg.	24.50	15.84	17.50	113.39	18.97	32.00	48.00	74.98
Oct. 31	24.50	16.80	17.50	126.00	19.00	32.00	48.00	80.00
Oct. 30	24.50	15.80	17.50	124.25	19.00	32.00	48.00	80.00
Oct. 27-28	24.50	15.80	17.50	121.00	19.00	32.00	48.00	80.00
Oct. 26	24.50	15.80	17.50	119.75	19.00	32.00	48.00	80.00
Oct. 25	24.50	15.80	17.50	118.75	19.00	32.00	48.00	80.00
Oct. 24	24.50	15.80	17.50	117.50	19.00	32.00	48.00	80.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Nov. 9, 1950; gross tons
Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Nov. 9	$41.67
Nov. 2	41.67
Oct. 1950	41.37
Nov. 1949	28.96
Nov. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$44.00
No. 2 Heavy Melt.	41.00
No. 1 Busheling	44.00
No. 1 Bundles	*46.50*
No. 2 Bundles	39.00
Heavy Turnings	*45.00-46.00*
Machine Shop Turnings	*36.00-36.50†*
Mixed Borings, Turnings	*36.00-36.50†*
Short Shovel Turnings	38.00
Cast Iron Borings	36.00-37.00
Low Phos. Steel	*53.50-54.00*

Cast Iron Grades

No. 1 Cupola Cast	55.00-56.00
No. 1 Machinery Cast	*59.00-60.00*
Charging Box Cast	*54.00-55.00*
Heavy Breakable Cast	*53.00-54.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
Rails, Random Lengths	*63.50-64.00*
Rails, 2 ft. and under	66.50-67.50‡
Rails, 18 in. and under	67.50-68.50‡
Railroad Specialties	60.00-61.00

† Crushers' buying prices.
‡ Nominal

CLEVELAND

(Delivered Consuming Plant)

No. 1 Heavy Melt. Steel	$43.00-43.50
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 Busheling	42.50-43.00
No. 1 Bundles	42.50-43.00
No. 2 Bundles	31.00-31.50
Machine Shop Turnings	35.00-35.50
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings	36.50-37.00
Cast Iron Borings	36.50-37.00
Low Phos.	46.00-46.50

Cast Iron Grades

No. 1 Cupola	62.00-63.00
Charging Box Cast	49.00-50.00
Stove Plate	46.00-47.00
Heavy Breakable Cast	49.00-50.00
Unstripped Motor Blocks	39.00-40.00
Brake Shoes	46.00-47.00
Clean Auto Cast	62.00-63.00
No. 1 Wheels	52.00-53.00
Burnt Cast	43.00-44.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
R.R. Malleable	64.00-65.00
Rails, 3 ft and under	64.00-65.00
Rails, 18 in. and under	65.00-66.00
Rails, Random Lengths	60.00-61.00
Cast Steel	51.00-52.00
Railroad Specialties	53.00-54.00
Uncut Tires	58.00-59.00
Angles, Splice Bars	61.00-62.00

VALLEY

No. 1 Heavy Melt. Steel	$43.50-44.00
No. 2 Heavy Melt. Steel	39.50-40.00
No. 1 Bundles	43.50-44.00
Facty. Prod. Bundles	43.50-44.00
No. 2 Bundles	34.00-34.50
Machine Shop Turnings	35.00-35.50
Short Shovel Turnings	37.00-37.50
Cast Iron Borings	37.00-37.50
Low Phos.	46.00-46.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$39.00-43.00
No. 2 Heavy Melt. Steel	36.00
No. 1 Busheling	38.00
No. 1 Bundles	39.00-43.00
No. 2 Bundles	32.00
Short Shovel Turnings	33.00
Machine Shop Turnings	*29.00-30.00*
Mixed Borings, Turnings	26.00-27.00
Low Phos. Punchings and Plate, elec. fur. grade	*49.00-50.00*
Low Phos. Plate, 5 ft & Under	48.00-49.00
Elec. Furnace Bundles	*46.00*
Heavy Turnings	39.00
No. 1 Chemical Borings	40.00
Knuckles and couplers	*52.00-53.00*
Steel car wheels	*52.00-53.00*

Cast Iron Grades

No. 2 Cupola Cast	*52.00*
No. 1 Machinery Cast	*55.00-56.00*
No. 1 Yard Cast	49.00-50.00
Charging Box Cast	50.00-51.00
Heavy Breakable Cast	49.00-50.00
No. 1 Wheels	*62.00*
Malleable	*65.00-67.00*

CINCINNATI

No. 1 Heavy Melt. Steel	$43.50
No. 2 Heavy Melt. Steel	40.50
No. 1 Busheling	43.50
No. 1 Bundles	43.50
No. 1 Black Bundles	40.50
No. 3 Bundles	30.00
Machine Shop Turnings	29.00
Short Shovel Turnings	31.00
Mixed Borings, Turnings	30.00
Cast Iron Borings	31.00

Cast Iron Grades

No. 1 Cupola Cast	62.00
Charging Box Cast	53.50
Stove Plate	45.00
Heavy Breakable Cast	52.00
Unstripped Motor Blocks	40.00
Brake Shoes	34.00
Clean Auto Cast	62.00
Drop Broken Cast	65.00
Low Phos., 18 in. and under	56.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00
R.R. Malleable	60.00
Rails, Rerolling	62.00
Rails, Random Lengths	62.00
Rails, 18 in. and under	70.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$30.00-31.00
No. 1 Bundles	37.00-37.50
No. 2 Bundles	29.00-30.00
No. 1 Busheling	37.00-37.50
Machine Shop Turnings	29.00-29.50
Forge Flashings	37.00-37.50
Short Shovel Turnings	31.00-31.50
Cast Iron Borings	31.00-31.50
Punchings & Plate Scrap	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast	50.00-55.00
Heavy Breakable Cast	35.00-40.00
Clean Auto Cast	55.00-60.00

BUFFALO

No. 1 Heavy Melt. Steel	$41.00-42.00
No. 2 Heavy Melt. Steel	38.00-38.50
No. 1 Busheling	38.00-38.50
No. 1 Bundles	39.50-40.00
No. 2 Bundles	36.00-36.50
Machine Shop Turnings	31.50-32.50
Mixed Borings, Turnings	35.00-36.00
Cast Iron Borings	35.00-36.00
Short Shovelings	35.00-36.00
Low Phos.	44.00-45.00

Cast Iron Grades

No. 1 Cupola	*47.00-48.00*
No. 1 Machinery	49.00-50.00
Malleable	56.00-58.00

Railroad Scrap

Rails, 2 ft. and under	60.00-61.00
Rails, random size	53.00-54.00
Railroad Specialties	53.00-53.50

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$34.50*
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	32.00-33.00
No. 1 Bundles	34.50*
No. 2 Bundles	28.00-29.00
Mixed Borings, Turnings	*25.00-25.50*
Machine Shop Turnings	*25.00-25.50*
Short Shovel Turnings	26.00-27.00
Punchings & Plate Scrap	37.00-38.00
Low Phos. Plate, 5 ft & under	37.00-38.00
Elec. Furnace Bundles	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	*43.00-44.00*
No. 1 Machinery	*45.00-46.00*
Charging Box Cast	40.00-41.00
Heavy Breakable	40.00-41.00
Unstripped Motor Blocks	*38.00-39.00*

• Nominal

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$32.50-33.00
No. 2 Heavy Melt. Steel	*29.00-29.50*
No. 1 Bundles	32.50-33.00
No. 1 Busheling	29.00-29.50
Machine Shop Turnings	*24.50-25.00*
Short Shovel Turnings	*26.00-26.50*
Mixed Borings, Turnings	*25.50-26.50*
Bar Crops and Plate	40.00-42.00
Punchings & Plate Scrap	40.00-42.00
Chemical Borings	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	41.00-42.00
Mixed Cast	39.00-40.00
Heavy Breakable Cast	38.50-39.50
Stove Plate	39.00-41.00

CHICAGO

No. 1 Heavy Melt. Steel	$40.00
No. 2 Heavy Melt. Steel	38.00
No. 1 Bundles	40.00
No. 2 Bundles	35.00
Machine Shop Turnings	34.00
Mixed Borings, Turnings	34.00
Short Shovel Turnings	34.00-36.00*
Cast Iron Borings	34.00
Low Phos.	*51.00-53.00*
Elec. Furnace Bundles	42.00-43.00
Heavy Turnings	37.00-38.00
Cut Structurals	47.00-48.00

Cast Iron Grades

No. 1 Cupola Cast	*58.00-60.00*
Clean Auto Cast	*58.00-60.00*
No. 1 Wheels	54.00-55.00
Stove Plate	43.50-44.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.00-47.00*
Malleable	66.00-67.00
Rails, Rerolling	64.00-65.00
Rails, Random Lengths	59.00-60.00
Rails, 2 ft. and under	*64.00-66.00*
Rails, 18 in. and under	*66.00-67.00*
Railroad Specialties	56.00-57.00
Angles, Splice Bars	59.00-60.00

• Brokers' buying price.

BIRMINGHAM

No. 1 Heavy Melt. Steel	$38.00-40.00
No. 2 Heavy Melt. Steel	34.00-35.00
No. 1 Busheling	36.00
No. 2 Bundles	35.50
Machine Shop Turnings	30.00
Mixed Borings, Turnings	28.00
Short Shovel Turnings	34.00
Cast Iron Borings	28.00
Bar Crops and Plate	44.00-45.00
Cut Structurals	44.00

Cast Iron Grades

No. 1 Cupola Cast	54.00
Stove Plate	47.00-48.00
No. 1 Wheels	nominal

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00-41.00
R.R. Malleable	nominal
Rails, Rerolling	58.00-59.00
Rails, 2 ft and under	59.00-60.00
Angles and Splice Bars	50.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$41.00-43.00
No. 2 Heavy Melt. Steel	36.50-37.50
No. 1 Bundles	40.00-41.00
No. 2 Bundles	36.00-37.00
Machine Shop Turnings	30.00-31.00
Short Shovel Turnings	*32.00-33.00*

Cast Iron Grades

No. 1 Cupola Cast	*55.00-57.00*
Charging Box Cast	*45.00-46.00*
Heavy Breakable Cast	*46.00-47.00*
Brake Shoes	47.00-49.00
Clean Auto Cast	*57.00-59.00*
Burnt Cast	*43.00-45.00*

Railroad Scrap

R.R. Malleable	62.00-64.00
Rails, Rerolling	60.00-61.00
Rails, Random Lengths	58.00-60.00
Rails, 2 ft and under	61.00-63.00
Uncut Tires	53.00-54.00
Angles, Splice Bars	60.00-62.00
Railroad Specialties	55.00-57.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$26.50
No. 2 Heavy Melt. Steel	24.50
No. 1 Bundles	26.50
No. 2 Bundles	22.50
No. 3 Bundles	19.50
Machine Shop Turnings	13.00
Low phos, electric	40.00

Cast Iron Grades

No. 1 Cupola Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	26.50
Rails, Random Lengths	26.50

SEATTLE

No. 1 Heavy Melt. Steel	$24.00*
No. 2 Heavy Melt. Steel	24.00*
No. 1 Busheling	21.50
Nos. 1 & 2 Bundles	22.00
No. 3 Bundles	18.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Punchings & Plate Scrap	30.00-32.50
Cut Structurals	30.00-32.50

Cast Iron Grades

No. 1 Cupola Cast	35.00-41.00
Heavy Breakagle Cast	30.00-35.00
Stove Plate	25.00-27.50
Unstripped Motor Blocks	30.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	35.00
No. 1 Wheels	32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	25.00
Railroad Malleable	30.00
Rails, Random Lengths	26.50
Angles and Splice Bars	25.00

• Nominal

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$26.50
No. 2 Heavy Melt. Steel	24.50
No. 1 Bundles	26.50
No. 2 Bundles	22.50
No. 3 Bundles	17.50
Machine Shop Turnings	13.00
Punchings & Plate Scrap	40.00

Cast Iron Grades

No. 1 Cupola Cast	49.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	nominal
Rails, Rerolling	39.50

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$30.00
No. 1 Bundles	30.00
Mechanical Bundles	28.00
Mixed Steel Scrap	28.00
Mixed Borings, Turnings	23.00
Rails, Remelting	30.00
Rails, Rerolling	33.00
Busheling	24.50
Bushelings new factory, prep'd	28.00
Bushelings new factory, unprep'd	23.00
Short Steel Turnings	23.00

Cast Iron Grades*

No. 1 Machinery Cast.	45.00

• F.o.b. shipping point.

shoveling turnings

use:

Turnings of this type are a leading grade of industrial and factory scrap used in blast furnaces and open hearths. Since long turnings tend to clog the charging bell of blast furnaces or make charging into the open hearth more difficult, they are frequently processed through crushing machines. Crushed turnings make a more economical charge because they load heavier, and serve to fill up the interstices in heavier steel scrap.

source:

Machining operations on steel produce shavings from which shoveling turnings are processed.

This is one of a series illustrating the many and varied types of scrap required in the making of iron and steel for every use. Our national organization, manned by personnel who is steeped in every phase of scrap knowledge, is ready to meet your every scrap problem.

specifications:

Shoveling Turnings. Clean short steel or wrought iron turnings, drilling or screw cuttings. May include any such material whether resulting from crushing, raking or other processes. Must be free of springy, bushy, tangled or matted material, lumps, non-ferrous metals in a free state, scale, grindings, or excessive oil.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

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LEBANON, PENNA.
READING, PENNA.
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MODENA, PENNA.
PITTSBURGH, PENNA.
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MAIN OFFICE

LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

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BOSTON, MASS. Statler Building
CLEVELAND, OHIO 1022 Midland Bldg.
LEBANON, PENNA. Luria Building
PUEBLO, COLORADO 334 Colorado Bldg.
BUFFALO, N. Y. Genesee Building
DETROIT, MICHIGAN 2011 Book Building
NEW YORK, N. Y. Woolworth Building
READING, PENNA. Luria Building
ST. LOUIS, MISSOURI 2110 Railway Exchange Bldg.
SAN FRANCISCO, CALIFORNIA Pacific Gas & Elec. Co., Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Sheets, Strip . . .

Sheet and Strip Prices, Page 141 & 142

Chicago—Three factors will restrict amount of sheet and strip available to civilian users next year: Military orders and other directed programs will cut more sharply into mills' output of flat-rolled; production will be cut back to permit boost in plate production; and large carryovers will reduce amount available on new orders. At some mills average customer's quota cut will run as high as 50 per cent.

Military ordering is snowballing. It is understood du Pont requires 4000 tons of carbon strip a month in connection with its AEC undertaking. Some curtailment in flat-rolled consumption is believed inevitable due to pile-up at the retail level of certain home appliances and automobiles. As yet, only isolated manufacturers have announced cutbacks. Furthermore, for some time after such cutbacks are effected, the attempt will be made by users to enlarge inventories. Cold-rolled sheets are being offered in the gray market at $420 a ton.

Philadelphia—Due to rated tonnage and substantial arrearages, sheet producers have closed January schedules without entering any new free tonnage. Prospect for February is somewhat better, as there will be less arrearages. However, defense work will be heavier and supply will be stringent. Mills generally are selling on a monthly basis. One leading producer has had to defer in January the rolling of a substantial tonnage of heavy gage enameling stock because of the diversion of facilities to car steel. Several manufacturers of sinks, wash basins and similar products in this district will be affected.

The Conshohocken, Pa., producer is reported to be planning the early discontinuance of its line of high-strength low-alloy sheets, possibly by around Jan. 1.

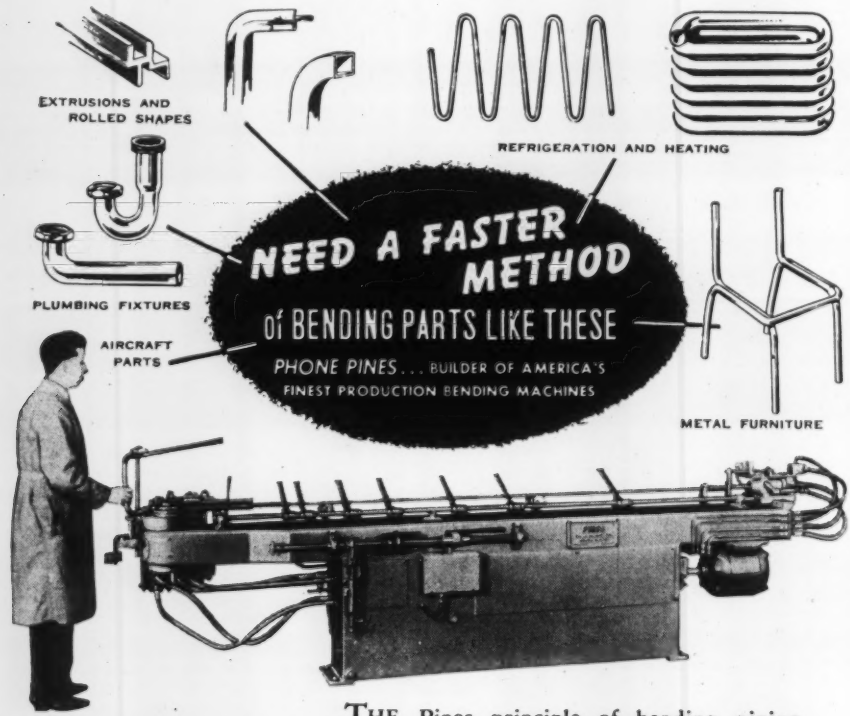
Cleveland — Further tightening in sheet and strip supply looms. DO and other emergency-rated orders are coming to the mills in heavier volume with the leadtime deadline for January tonnage about at hand. Until full extent of January emergency demands is known, producers will be unable to make firm commitments for that month on civilian tonnage. This explains the slowness of sellers in opening books for general business in the period. The fact carryover from fourth quarter will be substantial, that some sheet-rolling capacity will be diverted to production of light plates by first quarter, and that emergency-rated tonnage demands will be taking a much larger proportion of output serve to dash hopes of any early betterment in the outlook for civilian goods sheet supply.

Cincinnati—Sheet mills are hesitant about definite acceptance of tonnage for first quarter, and will likely hold to month-by-month schedules. DO orders are gradually increasing and these, with carryover, will absorb most of January production.

Boston — Considerable non-rated November-December flat-rolled tonnage is being rescheduled for January, increasing carryover, which coupled with mounting DO orders, drastically reduces openings for commercial volume. Rocket parts, cartridge clips and miscellaneous armament requirements are heavier. Inventories with nonintegrated cold strip mills are deteriorating with rolling schedules frequently revised notably on high carbon. This group is advancing prices on carbon and alloy strip in uneven pattern; some have made no price move and wide range of quotations prevails. At New Haven, for instance, a spread of $14 per ton exists between two producers of cold-rolled carbon strip.

Pittsburgh — Nonintegrated cold-rolled strip interests have been successful in supplementing rolling schedules with conversion tonnage supplied by customers to maintain 5 days per week production pace. Occasionally schedules are extended to 6 days depending on fluctuations in volume of hot-rolled material received from suppliers. Nonintegrated strip producers here have not yet adjusted size extras upward $3 to $9 per ton for 16 gage and heavier in line with such action adopted by eastern producers. Some integrated mills are booked through January and February on maximum tonnage commitments of rated orders for hot and cold-rolled sheets. A large percentage of these rated orders are for landing mats.

Los Angeles — With galvanized sheets in better supply, Japanese galvanized tonnage available at $307 per ton finds few buyers.


EXTRUSIONS AND ROLLED SHAPES
REFRIGERATION AND HEATING
PLUMBING FIXTURES
AIRCRAFT PARTS
METAL FURNITURE
NEED A FASTER METHOD
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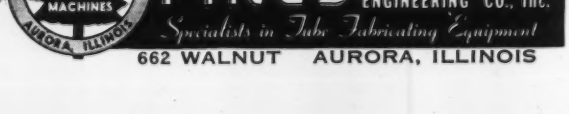

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Semifinished Steel . . .

Semifinished Prices, Page 141

Pittsburgh—Inadequate sheet bar supply shows no signs of improving and represents a major obstacle to full utilization of hand sheet mills. Nonintegrated mills have been able to maintain near capacity production schedules only through converting steel supplied by customers. This conversion charge on hot bands, for example, has increased about $10 per ton since last spring and tops the previous high in the summer of 1948.

Los Angeles—Completion of $125 million refinancing program permits Kaiser Steel Corp. to start immediately planned expansion of Fontana plant. Additional open-hearth furnace will boost ingot-capacity to 1,380,000 tons annually.

Steel Bars . . .

Bar Prices, Page 141

Boston—Most rated bar orders are for January processing and incoming volume, carbon and alloy, is heavier. With some mills several weeks behind on deliveries, carryovers are substantial, indicating wave of schedule revisions first quarter cutting down civilian allocations. With cold finishing units, uncertain outlook for hot-rolled, complicates production schedules. Output at New Haven is down while largest producer moves into new plant. One leading supplier of cold finished has advanced extra on ground and polished $5 ton and $10 on turned, ground and polished, turned and polished and rough turned.

New York—Leading hot bar sellers are setting up schedules for January; some have set up tentative schedules for the following month. Yearend arrearages, combined with rated work, will absorb all of January output and a large amount of February output. Hot alloy bar schedules are virtually frozen for January now that the 45-day lead time is practically at hand. Cold-drawn carbon and alloy bar promises are more extended. Most cold drawers have tentatively set up schedules for first quarter, although in view of expanding rated work there probably will be various changes before the period advances too far.

Philadelphia—Some bar producers have not yet gone through the formality of opening and closing their books for January, but to all practical intents and purposes they are definitely out of the market on nonrated tonnage until February. Indications are they will not have much capacity for such work even then. Carryovers at the end of this year will be substantial and, added to rated tonnage, will not only absorb most of January output, but February's as well.

Pittsburgh—Alloy bar producers are hard pressed maintaining production schedules due to nickel supply problem. Demand exceeds supply by a wide margin. In addition to increased requirements for military uses, sellers expect shipments to petroleum interests and other indirect military consumers will be augmented over coming months.

Cleveland—Carryover tonnage from fourth quarter will be more than

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enough to fill January rolling schedules. DO order deadline for that month falls about Nov. 15. Such tonnage has increased noticeably. Until producers know the full extent to which they will be called upon to satisfy such needs they will be unable to make firm commitments on civilian account.

St. Louis—Merchant and building bar supplies, already tight, are beginning to shrink under impact of DO orders. Percentage of tonnage under rated claims is trifling but unrated consumers are staging what one bar producer calls a "give me mine now" stampede. Building bars are further stimulated by a general opinion government will permit completion of banned types of construction already under way. Steel joists, ordinarily in slack demand in the winter months, are five months behind on deliveries.

Seattle—Demand for merchant bars is fairly active while that for small tonnages of reinforcing continues strong.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 141

Pittsburgh—Concrete steel bar demand exceeds supply by a wide margin. Sellers are making commitments for only one month ahead on a mill allotment basis. Some interests have not yet booked maximum percentage obligation of DO rated tonnage. In contrast to this policy of entering firm commitments for only one month ahead, producers are accumulating order backlog on sheet and bearing piles which are extended eight months in some instances. Inquiries and awards last week were devoid of large tonnage projects.

Cleveland—Normal seasonal slowing down in building activity is reported but a large volume of work remains and reinforcing bars continue in strong demand. Fabricators' stocks are limited.

Structural Shapes . . .

Structural Shape Prices, Page 141

Boston — Lengthening deliveries prompt public works departments to advance programs for estimates. New Hampshire has listed bridge projects for site inspection to be closed in February when designs are complete. One pier project, 1600 tons, East Boston, bids in, has been temporarily withdrawn. Scattered ratings are appearing for structural projects, including hangars. New inquiry includes 1885 tons, deck girder bridge, Housatonic river, Newtown-Southbury, Conn. and contracts are led by 5000 tons, approaches, East Boston expressway, to Harris Structural Steel Co., New York. Inventories with structural shops are low and many are shying away from wide-flange work.

New York—While awards are temporarily light, considerable construction work is being figured, notwithstanding the advancing season. Bridge work has turned upward after a recent dip. Industrial work is leveling off and apartment house construction lags. Shape supply is tightening. Fabricators complain of curtailed receipts of steel and are revising some delivery promises.

Philadelphia—Shape producers generally have set up schedules for January, and are planning to proceed on a month-to-month rather than on a quarterly basis. Exceptions are where commitments have been made on identified projects. Even then there is some uncertainty as to deliveries very far in the future. Meanwhile, fabricators report a further decline in stocks, and curtailment in production due to difficulty in making inventory replacements. Commitments now are so far extended and the outlook so unsettled that fabricators are figuring only on a limited amount of work; for the same reason, contractors are moving more cautiously, although still offering considerable work for figures.

Pittsburgh—Structural fabricators note a leveling off in new inquiries. Exception to this trend are inquiries of a military nature, particularly bridges. Some interests cannot promise deliveries on certain types of work for 10 months. Order backlogs generally average about four to five months. Awards last week included 350 tons to Crump, Inc., Pittsburgh, for Carnegie Tech's $1.3 million graduate school of Industrial Engineering administration building.

Cleveland—Defense and other emgency demands are expected to take up any slack which may develop in demand for structural steel. Mill backlogs extend well into first quarter and there is little prospect for

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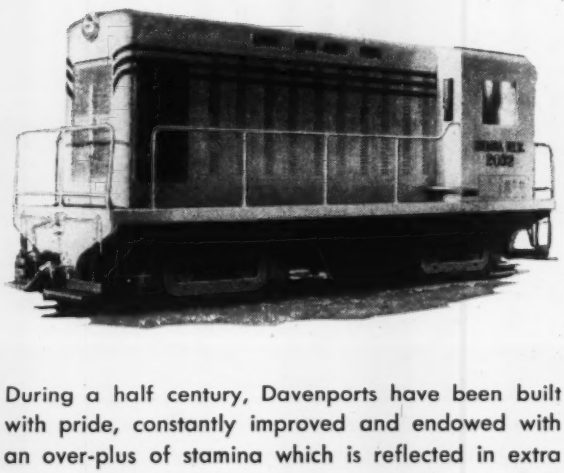

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any easing in supply conditions for months to come.

Chicago—Fabricators are exercising discretion in accepting new jobs. Bulk of projects bid on will have war production potentials. Steel mill expansion eats heavily into structural supply, reducing amount on allocation. Other important users, tonnagewise, are not likely to reduce demands in the foreseeable future. Some mills have scheduled higher shape production at the expense of bar output.

Los Angeles—Fabricators' backlogs, even of non-rated construction, are up sharply. Threat of curbs coupled with higher building costs is causing a speed-up of $250 million state school construction.

Seattle—Considerable tonnage of structural shapes is pending and several important projects are scheduled for early action. Fabricators hesitate to bid on large jobs.

Plates . . .

Plate Prices, Page 141

New York—Plate producers generally have about completed scheduling for January, as the lead time limit falls around middle of this week. There will be little, if anything, in the way of new non-rated tonnage entered, because what is not preference work will be absorbed by yearend arrearages. Some mills will be working on arrearages in February. As more programmed tonnage is approved in Washington, nonrated buyers face increasing difficulty in obtaining supplies. However, there will be less rated than nonrated tonnage for at least several months to come.

Boston — Already booked beyond maximum reservations on rated orders are some plate producers and wider distribution of January tonnage is indicated. This is cropping out in tentative allocations to civilian users for that month. Tank shops are confronted with lower tonnage with car building shops getting more steel next quarter, the peak likely in February-March. There has been good demand for propane gas tanks for some time. Actually mills are taking limited volume for first quarter, pending clarification of rated tonnage; few are clear as to how much tonnage will be available for civilian needs. More Navy work is being assigned district shipyards, mostly conversions with new submarines to Groton, Conn., and Portsmouth, N. H.

Philadelphia—Plate sellers have virtually closed schedules until February. A little preference tonnage may be worked in between now and Nov. 15, but most mills already have received their quotas of defense work and, accordingly, are out of the market until they commit themselves for February. They were able to accept little, if any, new nonrated tonnage for January.

Cleveland — Plate producers are booked solidly through remainder of the year and with heavy order carryover into first quarter promised and rising emergency demands, they are moving slowly in accepting new business. Tonnage is being offered in the gray market at high prices but the volume is relatively small. Although some continuous sheet capacity is expected to be diverted to production of light plates in the near future, no early easing in plate supply conditions is anticipated.

Seattle—Plate fabricators report fair volume of business in small tonnages, but the current shortage of materials may compel restricted operations.

Wire . . .

Wire Prices, Page 143

Pittsburgh — American Steel & Wire Co. reduced the base price on merchant quality galvanized wire, barbed wire and woven fence, and galvanized stone wire in line with recently established "sliding scale" extras based on 5-cent zinc. The net result of this action is an advance of $4 per ton including extras, with exception of galvanized stone wire which is up $8 per ton. Company's new price on galvanized nails and staples is column 104, with exception of Worcester, which is column 110; non-stock galvanized nail price is $5.25 and $5.55 per 100 pounds, respectively. Columbia Steel and Tennessee Coal, Iron & Railroad Co. revised prices a like amount on products produced.

Boston—Uneven price increases are posted for some wire specialties, but with exception of galvanized no general advance has been announced. More rated orders are appearing with

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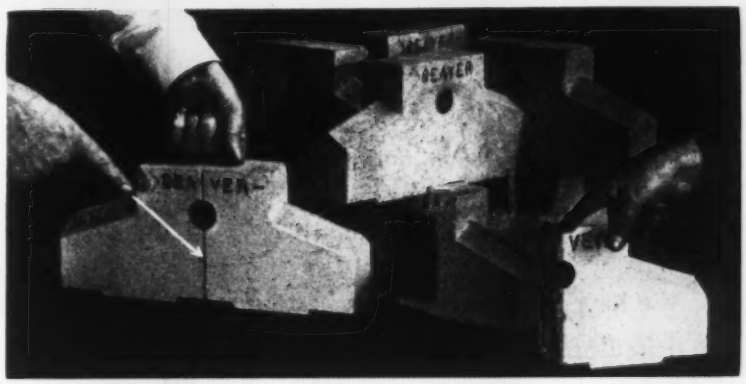

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holders of certified contracts frequently seeking to obtain requirements ex-quota. First quarter schedules will reflect this increase in DO orders at expense of non-rated allocations; substantial part of this volume is of secondary type. Pressure for valve spring wire and other specialties for automobile assembly is unabated, and, while actually consumption is high, part of this pressure appears to be for inventory.

Tubular Goods . . .

Tubular Goods Prices, Page 144

Boston—While relatively few rated orders for steel pipe and tubing are placed in this area, enough volume in that category is reaching pipe mills to effect January allocations which will be lower. Merchant steel pipe demand with distributors holds at levels prohibiting any substantial building of inventories. Expected decline in new housing, 1951, might well lower requirements of plumbing and heating distributors. Utilities are sounding out prospects for 1951 tonnage, but until status and route of proposed natural gas lines are clarified, few can close on specific tonnage.

Seattle—Cast iron pipe sales agencies are handicapped because of slow and uncertain deliveries. Nearly all bid calls include alternatives.

NOTICE to all Pig Iron Users

We have been advised that certain individuals have solicited orders for Lone Star Steel Company pig iron for delivery at premium prices. Such solicitations are without the knowledge or approval of this Company. The policy of Lone Star Steel Company continues to be one of selling direct to melters of pig iron at regular published prices. This Company will not knowingly sell to any buyer whose purchase is for resale.

The only authorized agents for Lone Star Steel pig iron are:

T. H. BENNERS & CO., Birmingham, Alabama

DEBEVOISE-ANDERSON CO., INC. New York City, N. Y.

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All inquiries should be directed to one of the above authorized agents or to the Sales Department of Lone Star Steel Company.

E. B. GERMANY, *President*

LONE STAR STEEL COMPANY

DALLAS, TEXAS

Ferroalloys . . .

Ferroalloy Prices, Page 145

Nashville, Tenn.—Tennessee Products & Chemical Corp. advanced prices on spot shipments of certain ferroalloys, due to increased and advancing costs. Prices per pound of contained Si named on ferrosilicon, f.o.b. cars, Chattanooga, with freight allowed to destination are: Standard lump, 50 per cent, 12.05c; 75 per cent, 14.30c; 90 per cent, 17.35c; low impurity 65 per cent, 15.30c. Price named on ferromanganese, f.o.b. cars, Chattanooga, is $190 per gross ton for the standard lump, 78 to 82 per cent grade. Prices on other grades, sizes and preparations will be adjusted accordingly for spot shipments, as will be less-than-carload prices on these commodities.

Pig Iron . . .

Pig Iron Prices, Page 140

Pittsburgh—U. S. Steel Corp.'s subsidiaries advanced pig iron $3 per gross ton, effective Nov. 4, to the following price levels at various production points: Basic, $49; No. 2 foundry and malleable, $49.50; and bessemer, $50.

Lone merchant foundry and malleable iron producer here states essential requirements from customers for November delivery are about 3000 tons above anticipated output during the period. Some form of governmental distribution regulation may be effected before year-end covering pig iron shipments to preferred consumer groups.

Boston—Larger users of pig iron, notably textile mill equipment shops, have built up inventories substantially. Melt is maintained with slight gains in spots, although the armament program has developed limited rated volume to date. Basic consumption is maintained with not more than one or two open hearths down any one week. New open hearth at Phillipsdale, R. I., will not start pouring until well into first quarter at least.

New York—Pig iron inventories at foundries are shrinking rapidly. Some plants have less than a week's supply; some are practically on day-to-day supply basis. Even where tonnage is known to be in transit, on the railroads, requests have come through to suppliers to furnish spot lots of five tons or so by truck, to fill in the gaps. While these cases are the exception, they indicate the seriousness of the situation. Practically all foundries are operating at least five days a week and, in some instances, six. Coke supply is adequate now, but there is considerable concern over the outlook for this winter.

Philadelphia—Pig iron supply is increasingly tight. Some foundries have less than a week's supply on hand. As a result, they are buying substantially more scrap, despite advancing prices. Some foundries have reduced their ratio of pig iron to scrap from around 40 per cent to 20 per cent. Much more interest is being focused on foreign iron, but deliveries are extended. Little foreign iron can be had until late in the first quarter. Prices are around $57, fas.

Buffalo—District pig iron output returned to 100 per cent of capacity when the Bethlehem Lackawanna furnaces resumed production after being banked because of an unauthorized strike. All six of the plant's furnaces are producing basic iron. Demand for merchant iron is brisk.

Cleveland—Merchant iron suppliers are unable to satisfy promptly all the demands coming to them. They are allotting tonnage to customers based on past sales records, and are shipping out every pound of metal produced almost as quickly as it is produced. Furnace stocks are limited, as are foundry inventories. American Steel & Wire Co., U. S. Steel subsidiary, on Nov. 4 advanced its pig iron prices $3 per ton to the general market level. Only one blast furnace in this immediate district is inactive currently.

Cincinnati—Shipments of merchant iron into this district are holding close to levels reached two months ago.

Dallas, Tex.—Pig iron buyers are being advised by Lone Star Steel Co. that it is selling its iron direct to melters at regular published prices and that it will not sell to any buyer for resale. The company has only three authorized agents: T. H. Benners & Co., Birmingham, Debevoise-Anderson Co. Inc., New York, and Wilson & Geo. Meyer & Co., San Francisco.

St. Louis—Pig iron shortage has perked up interest in foreign sources. A fair amount is on order and a little has started arriving.

Scrap . . .

Scrap Prices, Page 148

Pittsburgh—Major consumers have been out of the market for open hearth grades the past few weeks and are not expected to make large tonnage dealer purchases until shipments on old orders are completed. Formula prices prevail on bulk of new buying by the smaller mills, exceptions being one mill in Toronto, O., district that has been reactivated, and on some conversion deals. Sales of short turnings this week at the previously reported level of $38, reaffirms the formula price for this grade. Crushers claim they are having considerable difficulty obtaining machine shop and mixed turnings within the present price range of $36-$37, which leaves them with insufficient margin as long as the short turnings price remains at $38. Some mills have offered to pay a springboard up to $2 per ton for shipment of turnings and other scrap grades from Detroit and the Southwest to Pittsburgh mills.

Boston—Steel scrap prices are firm and for the most part steady, No. 2 heavy melting and lighter grades advancing slightly. Most material is at formula levels. Movement of scrap is steady and maintained. Cast grades are strong, but upward trend in prices has eased slightly. Some buying of cast is for inventory. Tightening pig iron supply has not yet reached point where widespread increase in ratio of scrap in melt is apparent.

Philadelphia—While the major open-hearth grades of steel scrap show little change pricewise, machine shop turnings have advanced to $29-$30, delivered; low phos punchings and plate, electric furnace grade, $49-$50; electric furnace bundles, $46; knucklers and couplers and steel car wheels, $52-$53.

Cast prices also are strong. No. 1 cupola is now $52, delivered; No. 1 machinery, $55-$56. No. 1 wheels have jumped to $62; malleable, to $65-$67, with even higher prices reported.

New York—Cast scrap prices are soaring, as pig iron becomes increasingly scarce and district foundries are having to step up their ratios of scrap to meet expanding production. Brokers are buying No. 1 cupola cast at $43-$44, fob shipping point, and No. 1 machinery at $45-$46. Offerings for unstripped motor blocks have jumped $4 to $38-$39. No change in charging box and heavy breakable is noted. Prices on No. 1 heavy melting steel and No. 1 bundles continue nominally at $34.50, with little or no yard scrap available at this level. Mixed borings and turnings and machine shop turnings are higher at $25-$25.50.

Buffalo—Soaring prices on cast scrap in other markets is cited as the factor behind an additional $1 increase on cupola cast here which was reported changing hands within a range of $47-$48. The market has been somewhat hesitant in following the upturn in other centers. Material in outlying districts, which usually moves here, is reported going

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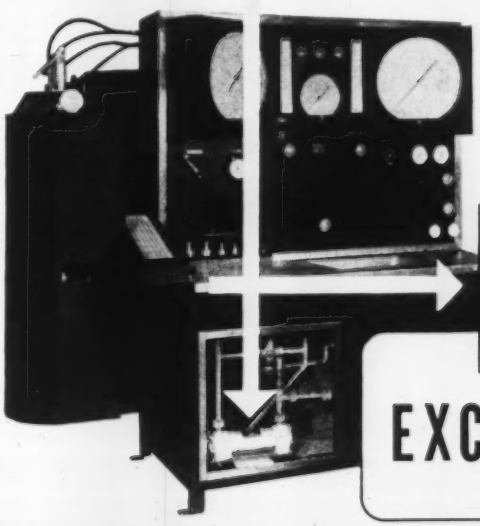

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elsewhere because of the price situation.

Cleveland—A large tonnage of short shovel turnings was purchased by a mill here last week at the formula price. This tends to strengthen the present pricing policy and indicates that no major price move will develop in the near future. The movement of material maintains a steady pace. No. 1 heavy melting holds at $43-$43.50 while short shovel turnings are $36.50-$37. No. 1 cupola cast is quoted $62.-$63.

Cincinnati — Scrap prices have levelled off, but the market continues strong. Tonnage is coming out in volume with few dealers holding any considerable tonnage. One factor in the free movement of scrap may be anxiety over post-election moves in Washington.

Chicago—So little scrap is moving at formula prices a break-through is regarded by most traders as virtually inevitable. Upgrading of material is rather widely admitted. Cast scrap zoomed upward again last week and is in extremely strong demand, all foundries operating to maximum permissible by raw materials supply. Foundries have been caught in a cost-price squeeze.

St. Louis—Locally scarce scrap and urgent outside demand, plus shorter pig iron supplies sent prices of cast grades skipping again last week. No. 1 cupola was quoted up $4 at $55, while charging box and auto cast rose $2 each, and burnt cast $1.

Seattle—Steel scrap buyers, in a strong sellers' market are having difficulty finding sufficient material to sustain full operation.

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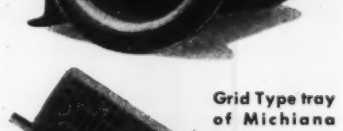
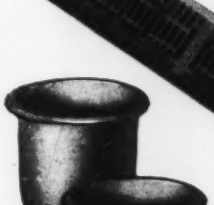
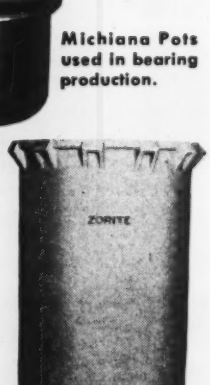

Grid Type tray of Michiana Zorite.


Michiana Pots used in bearing production.



Michiana Retort—Ni 34-38, Cr 13-17 Heat-Resistant Alloy.

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Heat Resistant and Stainless Steel
ALLOY CASTINGS

Warehouse . . .

Warehouse Prices, Page 145

Pittsburgh—Warehouse steel NPA order is expected to limit steel distributors' acceptance of rated orders to 30 per cent of monthly average bookings during the base period of first nine months this year. Producers are obliged to continue to ship to warehouse accounts on the same proportionate basis of total shipments to all consumer groups during the base period after allowance for tonnage set aside to meet DO rated orders and other preferred programs.

Cleveland—Unbalanced stock position of local warehouses is worsening under continued strong demand. Distributors, however, anticipate some improvement over coming months in inventory conditions as result of the National Production Authority regulation requiring steelmakers to allot certain percentages of their output to the warehouses to assure supplies for small consumers.

Chicago—Greater dependence on foreign steel is reported by distributors. Cost of this material in most cases conforms with that of domestic origin. Warehousemen, although grateful they will presently be allotted the same percentage of civilian steel they received in the first nine months, will suffer from the contracting supply of "free" steel after DO and other preferential tonnage is taken.

Cincinnati — Mill shipments to warehouses are modestly improved, but sales continue to eat away at inventories. Most active items are moved as soon as received by distributors. A famine situation exists in flat-rolled.

Los Angeles—Gray market steel offerings at 10-15 per cent above usual warehouse prices are increasing.

Seattle—While warehouse prices have not advanced, a rise is contemplated in cold-finished bars.

Rails, Cars . . .

Track Material Prices, Page 143

New York—Domestic freight car orders of 21,893 in October brought total awards in the last four months up to 101,849 cars, reports the American Railway Car Institute. Of the cars placed last month, 17,077 will be built in commercial shops and 4816 in railroad shops.

Backlogs as of Nov. 1 were 122,488 cars against 106,611 on Oct. 1 and 17,377 on Nov. 1, 1949. They are the highest since June 1, 1948, 85,291 being on the books of commercial shops and 37,197 on books of railroad shops.

Deliveries in October totaled 5501, against 5131 in September and 4532 a year ago. According to the Institute, only a limited increase in monthly deliveries will be possible until next March, after which time the increased steel allocations recently authorized by the National Pro-

duction Authority will begin to be reflected in the industry's output.

Los Angeles—Southern Pacific Co. purchased more than $8,400,000 of steel rails from Colorado Fuel & Iron Corp. and Columbia Steel Co. for the railroad's 1951 track renewal program.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 144

Pittsburgh — Trade is concerned over adequacy of oven furnace and foundry coke supply throughout coming months to meet growing demand from blast furnace and foundry interests. Utilization of presently idle beehive ovens should help, but will not entirely solve the problem. Acute scarcity of merchant foundry iron has prevented some foundries from stepping up production. This has eased pressure for higher beehive foundry coke prices.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5000 tons, contract B, north and south sections, East Boston Expressway, Boston, to Harris Structural Steel Co., New York.

885 tons, Wynnewood apartments, Wynnewood, Pa., to Bethlehem Steel Co.

475 tons, Pennsylvania Railroad bridge, Monmouth Junction, N. J., to American Bridge Co., Pittsburgh.

435 tons, Commercial Filters Corp., Boston, plant building, Melrose, Mass., to American Bridge Co., Pittsburgh; Morton C. Tuttle Co., Boston, general contractor.

350 tons, public school No. 199, Brooklyn, N. Y., to Schacht Steel Construction Inc., New York.

200 tons, C. W. Sharples, junior high school, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Poston Construction Co., Seattle, general contractors.

170 tons, addition, digester building, Union Bag & Paper Co., Savannah, Ga., to American Bridge Co., Pittsburgh; Morton C. Tuttle Co., Boston, general contractor.

150 tons, dormitory, Dickinson College, Carlisle, Pa., to Modern Iron Works, Reading, Pa.

140 tons, bridge and underpass, West Warwick, R. I., to American Bridge Co., Pittsburgh; General Engineering & Contracting Co., Providence, general contractor.

100 tons or more, school, Wareham, Mass., to Waghorne-Brown (Bethlehem Fabricators Inc.), Boston; Northern Steel Inc., Medford, Mass., reinforcing steel; John Cabobianco, Boston, general contractor.

100 tons, including five-inch grid, steel deck, draw span, design B, Fore river bridge, Quincy - Weymouth, Mass., to Carnegie-Illinois Steel Corp., Pittsburgh; Frederick W. Byron, Dedham, Mass., general contractor.

95 tons, Little river bridge, Gorham, Me. to American Bridge Co., Pittsburgh; Berry & Moser Construction Co., South Portland, Me., general contractor.

90 tons, single span stringer bridge, Townsend, Mass., to American Bridge Co., Pittsburgh; Henley-Lundgren Co., Shrewsbury, Mass., general contractor.

50 tons, elementary school, Torrington, Conn., to Topper & Griggs, Hartford; Bonvicini Building Co., Inc., Torrington, general contractor.

STRUCTURAL STEEL PENDING

2156 tons, state bridge work, Westmoreland and Indiana counties, Pennsylvania; bids Dec. 8.

2000 tons, military warehouses, etc., Fort Richardson, Alaska; bids to U. S. Engineer, Seattle, Nov. 9.

1885 tons, including 950 tons silicon structural steel, 4-span deck girder bridge, Housatonic river, Newton-Southbury, Conn.; bids Nov. 20, Hartford. Project also requires 910 tons steel piles and 7860 square feet open steel grid floor.

500 tons, joint Idaho-Oregon Snake river bridge; J. H. Wise & Sons, Boise, Idaho, low $374,198.

385 tons, three-span continuous WF beam bridge, Berkshire, Vt.; bids in Nov. 10.

150 tons, Coolin forest bridge and road; Henley Construction Co., Lewiston, Idaho, low to Bureau of Public Roads, $121,195.

105 tons, I-beam bridge, New Haven, Conn.; C. W. Blakeslee & Sons, Inc., New Haven, low $269,885.31.

100 tons, including reinforcing bars and piling, Seward-Anchorage highway, Alaska; bids to Bureau of Public Roads, Juneau, Alaska, Nov. 29.

Unstated, Great Northern Railway, 368-foot bridge, Swinomish Slough, Washington state; U. S. Engineer hearing Nov. 20.

Unstated, 1458-foot, cantilever span, Columbia river near The Dalles, Oreg.; plans completed, bids soon.

Unstated, six overhead structures, Union Pacific Railway, McNary dam relocation project; award to Morrison-Knudsen Co., Boise, Idaho, by U. S. Engineer.

Unstated, military installation near Richland, Wash.; Waale-Camplan Co., Portland, Oreg., low to U. S. Engineer, Seattle, $657,127.

REINFONRCING BARS . . .

REINFORCING BARS PLACED

525 tons, state bridge work, Westmoreland and Indiana counties, Pennsylvania; bids Dec. 8.

400 tons, C. W. Sharples junior high school, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Poston Construction Co., Seattle, general contractor.

140 tons, control tower and other structures, Elmendorf air field, Alaska, to Northwest

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There's no other half-yard crawler crane excavator as good . . . dollar for dollar . . . as the MICHIGAN! Why? Because only MICHIGAN gives you these job-proved, "big-machine" features:

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MICHIGAN POWER SHOVEL COMPANY

392 Second Street, Benton Harbor, Michigan, U. S. A.

Steel Rolling Mills Inc., Seattle; Morrison-Knudsen Co., Seattle, general contractor.

115 tons, grade school, Everett, Wash., and bank building, Wenatchee, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

65 tons, elementary school, Torrington, Conn., to Ceco Steel Products Co., New York; Bonvicini Building Co. Inc., Torrington, general contractor.

55 tons, three-span continuous WF beam bridge, Berkshire, Vt.; bids in Nov. 10.

20 tons, single span stringer bridge, Towsend, Mass., to Truscon Steel Co., Boston; Henley-Lundgren Co., Shrewsbury, Mass., general contractor.

15 tons, Little river bridge, Gorham, Me., to Bancroft & Martin Rolling Mills Co., Portland, Me.; Berry & Moser Construction Co., South Portland, Me., general contractor.

REINFORCING BARS PENDING

852 tons, state bridge, Allegheny county, Pennsylvania; bids Dec. 8.

600 tons, sewer system project, Tacoma; bids in Nov. 6.

375 tons, 710-foot Yakima river bridge, Washington state; Manson Construction & Engineering Co., Seattle, low to Atomic Energy Commission, $472,606.

290 tons, military warehouses and other structures, Fort Richardson, Alaska; bids to U. S. Engineer, Seattle, Nov. 8.

220 tons, four-span deck girder bridge, Housatonic river, Newton-Southbury, Conn.; bids Nov. 20, Hartford.

Unstated, $1 million service parts depot, Milwaukie, Oreg., for International Harvester Co.; general contract to Ross B. Hammond Co., Portland.

PLATES . . .

PLATES PLACED

350 tons, tanks for pulp plant, Weyerhaeuser Timber Co., Longview, Wash., to Hydraulic Supply Mfg. Co., Seattle.

PLATES PENDING

300 tons, 1-million gallon elevated water tank, tubular tower construction, Fort Lauderdale, Fla.; bids Nov. 13, city auditor and clerk.

PIPE . . .

CAST IRON PIPE PENDING

100 tons, 10, 8 and 6 inch cast iron pipe, also alternatives; bids to R. E. Walker, city clerk, Auburn, Wash., Nov. 7.

STEEL PIPE PENDING

Unstated, 5700 feet steel pipe, hydrants and fittings, L. E. Toland, Wenatchee, Wash., low $15,536, for Rock Island, Wash., water system.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Ann Arbor, 20 diesel-electric units, to American Locomotive - General Electric Companies, Schenectady, N. Y.; list comprises seven 2-unit 3200-hp freight locomotives, four 660-hp switching units, and two 1000-hp road switching units.

Duluth, South Shore & Atlantic, one 1000-hp diesel-electric road switching unit, to American Locomotive-General Electric Companies, Schenectady, N. Y.

Long Island, 12 diesel-electric units, to Fairbanks, Morse & Co., Chicago; list comprises eight 1600-hp and four 2400-hp passenger units.

Pacific Great Eastern, six 1600 hp diesels, to Montreal Locomotive Co., Montreal, Que.

RAILROAD CARS PLACED

Akron, Canton & Youngstown, 150 fifty-ton box cars, to Pullman-Standard Car Mfg. Co. Chicago.

Atlantic Coast Line, 2000 freight cars, including 500 fifty-ton box cars, 400 fifty-ton high side gondolas, 400 fifty-ton low side gondolas and 100 seventy-ton mill type gondolas, to American Car & Foundry Co., New York; 100 seventy-ton hopper bottom coal cars, to Greenville Steel Car Co., Greenville, Pa.; 500 fifty-ton pulp wood flat cars, to be leased through Equitable Life Assurance Society, and to be built by Pullman-Standard Car Mfg. Co., Chicago.

Boston & Maine, 750 fifty-ton box cars, for leasing through Equitable Life Assurance Society; construction by Pullman-Standard Car Mfg. Co., Chicago.

Boston & Maine, 750 fifty-ton box to Pullman-Standard Car Mfg. Co., Chicago, on lease from Equitable Life Assurance Society, New York.

Consolidated Railroads of Cuba, 12 self-propelled rail diesel cars, to Budd Co., Philadelphia.

Duluth Misabe & Iron Range, 300 seventy-ton hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Georgia, 50 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Great Northern, 1000 fifty-ton box cars, to its own shops, St. Cloud, Minn.

Illinois Central, 10 fifty-ton box cars, to American Car & Foundry Co., New York.

Kansas City Southern, 1000 freight cars; 600 seventy-ton gondolas to Pullman-Standard Car Mfg. Co., Chicago, and 400 fifty-ton box cars, to American Car & Foundry Co., New York.

Maine Central, 250 fifty-ton box cars to Pullman-Standard Car Mfg. Co., Chicago.

Nashville, Chattanooga & St. Louis, 150 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

New York, Susquehanna & Western Railroad, 16 stainless steel commuter coaches, to Budd Co., Philadelphia.

Northern Pacific, 250 seventy-ton gondolas, to American Car & Foundry Co., New York.

St. Louis-San Francisco, 200 fifty-ton gondola cars, to Pressed Steel Car Co., Chicago.

St. Louis Southwestern, 75 seventy-ton covered hopper cars, to American Car & Foundry Co., New York.

Western of Alabama, 110 fifty-ton box cars to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

Great Northern, 100 covered hopper cars; bids asked.

RAILS PENDING

Great Northern, 39,000 tons of 115-lb rail and accessories; pending.

KRANE KAR Loads and Unloads freight cars, trucks, trailers; Stores materials; expedites Plant Maintenance. Often cuts cost of handling loads to 8c a ton.

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SILENT HOIST & CRANE CO., 849 63rd ST., BROOKLYN 20, N.Y.

FERROALLOYS

(*Continued from page 145*)

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, Carload, packed, 8 MxD, 15.35c per lb of alloy; 1 ton, 16.2c; less ton lot, 17.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34.41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 20.5c per lb of contained silicon plus 11.3c per lb of contained silicon plus aluminum, 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Fe).

Contract carload, 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.75 per lb of contained W; 2000 lb W to 10,000 lb W, $2.85; less than 2000 lb W, $2.97. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $3.65 per lb of contained W; less than 1000 lb W, $3.75.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 19.00c per lb of contained Si; packed 20.40c; ton lot 21.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered, Spot, add 0.45c-0.75c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered, Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.0c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered, Spot, add 0.25c-2.70c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered, Spot, add 0.25c.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3⅜ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si) Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.
(Small size—weighing approx 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lot 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.04 per pound of Mo contained, f.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

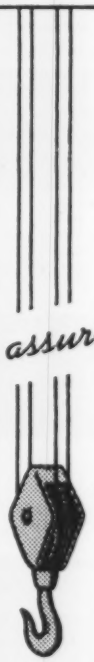
Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.). Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $167 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%.) Contract, $183 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

NOTE: Prices on vanadium, tungsten, zirconium, boron and "other" ferroalloys appeared on page 169, Nov. 6, 1950, issue.



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Metalworking Briefs

CONSTRUCTION, ENTERPRISE ORGANIZATIONAL CHANGES

California

Fluor Corp., Los Angeles, completed a $400,000 engineering building which accommodates 175 engineers and draftsmen. The firm engineers and constructs oil refineries.

California

Pennsylvania Salt Mfg. Co., Philadelphia, opened a sales office in the Woolsey building, Berkeley, Calif. R.. A. Snyder will do technical sales service work for metal and maintenance cleaners in industries in California, while J. Cameron Siddall will handle technical sales and service for agriculture.

California

Calaveras Cement Co., San Francisco, has started a $600,000 expansion program at its San Andreas plant in Calaveras county, California. Three new mills and eight new silos will be installed.

California

Blankform Mfg. Co., Los Angeles, was established to manufacture metal form dies, jigs, tools, and punch press parts for the aircraft industry. J. L. Simpson and M. E. Oppegard are the partners.

California

Mallinckrodt Chemical Works, St. Louis, will build a warehouse and headquarters for West Coast distribution in Los Angeles. The firm manufactures and distributes all types of chemicals for the drug industry.

California

Cam-Stat Inc., Los Angeles, started construction of a two-story plant in West Los Angeles. Thermostats will be manufactured under trade name "Cam-Stat." Completion is scheduled by December.

Delaware

International Metals & Mining Co. was chartered by the secretary of state's office, Dover, Del. Capital of the firm is listed at $20,000. Corporation Service Co., Delaware Trust Bldg., Wilmington, Del., is serving as the principal office.

Delaware

Stuk-O-Rite Inc.—machines—filed a charter of incorporation with the secretary of state's office, Dover, Del. Corporation Service Co., Delaware Trust Bldg., Wilmington, Del., is serving as the principal office.

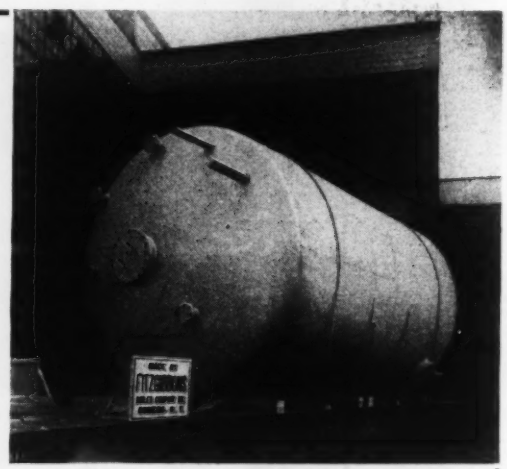
Delaware

American Siamese Tin Mining Corp. was chartered by the secretary of state's office, Dover, Del. Capital of the firm is listed at $10,000. Corporation Trust Co., Wilmington, Del., is serving as the principal office.

Delaware

Olympic Metal Products Co. Inc.—machine tools — was chartered by the secretary of state's office, Dover, Del. Capital of the firm is listed at $100,000. Registrar & Transfer Co., Dover, is serving as the principal office.

You design 'em... WE BUILD 'EM!



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Delaware

Anderson Valve Inc.—valves—filed a charter of incorporation with the secretary of state's office, Dover, Del. Capital of the firm is listed at $100,000. Mrs. Mary W. Burton, Dover, is serving as the resident agent.

Illinois

A. M. Castle & Co., Chicago, now represents **Worth Steel Co.,** Claymont, Del., on flanged products, including carbon steel heads, solid stainless heads and stainless-clad heads and plates, in the following territory: Iowa, Nebraska, Kansas, Oklahoma, and parts of Michigan, Indiana, Illinois, Wisconsin and Missouri.

Illinois

McGraw Electric Co., Elgin, Ill., awarded the contract for erection of a factory addition to Charles E. Giertz & Son, that city. Estimated cost is $250,000.

Illinois

Florence Stove Co., Kankakee, Ill., awarded the general contract for an addition to its plant to Campbell-Lowrie-Lautermilch, Chicago. Estimated cost is $365,000. Olson & Urbain, Chicago, is the architect.

Illinois

Sawyer Biscuit Co., Melrose Park, Ill., awarded the general contract for the erection of a baking plant to George A. Fuller Co., Chicago. Estimated cost is $7.5 million.

Illinois

St. Charles Mfg. Co., St. Charles, Ill., awarded the general contract for the construction of a factory building to Ragnar Benson Inc., Chicago. Estimated cost is $765,000.

Illinois

Production Tool Co., Broadview, Ill., awarded the general contract for the designing and construction of a shop building to Abell-Howe Co., Chicago. Estimated cost is $500,000.

Iowa

Sanitary Farms Dairies of Iowa, Cedar Rapids, Iowa, awarded the general contract for an addition to its plant to James Leck Co., Minneapolis, at $141,415.

Maryland

General Refractories Co., Chesapeake Ave. and Seventh St., Brooklyn, Md., maker of chrome and magnesite brick, etc., has begun an extension of its 3-tunnel kilns which, when completed, will augment the company's output by approximately 25 per cent.

Maryland

Custom Sheet Metal Co., 2201 Austin St., Baltimore, has moved into larger quarters in the rear of 4603 Hartford Rd., that city.

Maryland

Caldwell Casting Co. Inc., Baltimore, high pressure injection molded die castings, is moving into larger space on Shoemaker road, off Falls road, at Bare Hills.

Maryland

Penmarva Electric Mfg. Co. Inc., 21 S. Bethel St., Baltimore, manufacturer of electric equipment, such as connectors, ground strips, lock nuts, etc., has moved to 1620 East Gough St., that city.

Maryland

Cambridge Wire Cloth Co., Cambridge, Md., appointed the following distributors for its line of woven wire slings: Stanley E. Morris Co., Los Angeles; M. L. Foss Inc., Denver; Lindquist Hardware Co., Bridgeport, Conn.; Georgia Supply Co., Sa-

Star Molyflex Blades eliminate the biggest fault of high speed hack saw blades. *They're completely shatterproof and unbreakable in a frame.* That's true no matter how tough the job may be.

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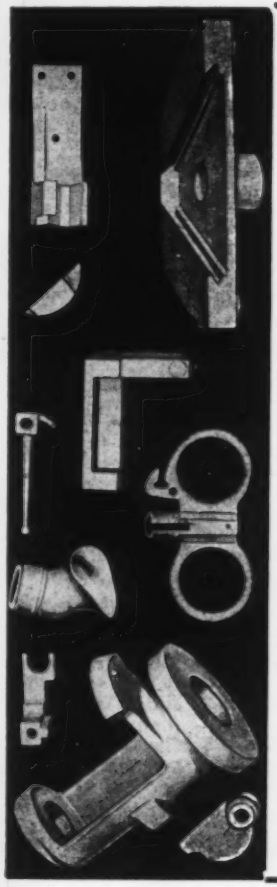

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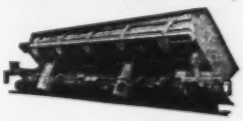

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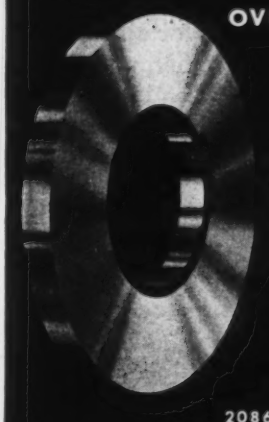

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